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ADAPTATION IN PATHOLOGICAL PROCESSES.¹

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ADAPTION in pathologic processes has the broadest biologic as well as medical interest. By the epithet "adaptive" it is intended to describe those morbid processes that bring about some sort of adjustment to changed conditions due to injury or disease. While it has been contended that the conception of adaptation has no place in science, I believe that natural phenomena must be investigated with regard to the meaning or idea which they represent.

From physiology we learn that the most wonderful and characteristic attribute of living organisms is their capacity for adaptation to external and internal conditions in a way tending to the welfare of the individual or species. Apparently these countless adaptations are full of purpose. So far as the existing order of nature is concerned, this theory is the foundation in forming a working biologic hypothesis. This seems an explanation of organic evolution. Physiologic adaptation occurring in organic evolution gives us the keynote to pathologic adaptation.

It is my opinion that those vital manifestations known as adaptive and compensatory are the necessary results of the energy inherent in living matter. The final result in no way directly influences the chain of events which leads to its production, nor does the character of the result in any way explain the mechanism.

Reviewing the history of the knowledge which we possess regarding protective processes and the methods of study by which this knowledge has been obtained, our attention is called to the importance of the new fields of research styled the mechanics of organic development and physiologic or experimental morphology.

One of the most interesting characteristics of pathologic adaptations is their foundation in physiologic processes—a fact of fundamental significance. Variation, natural selection, and heredity have in no direct

way influenced pathologic adaptations. As an illustration of the foregoing, an individual born with exclusive capacity for cardiac compensation could not perpetuate such a variation through the survival of the fittest unless heart lesions became common to the species. Contrasted with the perfection of physiologic adjustments, pathologic adaptations are markedly imperfect. The cells of the body are its only means of protection from outside attacks or in restoring its damaged parts, but their fitness for this function comes primarily from physiologic properties. Cardiac compensation is never perfect; renal hypertrophy never produces a healthy organ. The most striking example of such imperfection is found in the excesses, disorders, and failures incident to inflammation. The preeminent examples of pathologic adaptation are the compensatory hypertrophies, the regenerations, and the protective processes, including parasitic and antitoxic phenomena, with some manifestations of inflammation and fever as well as changes in internal secretions. Chief among compensatory hypertrophies are those recognized as work hypertrophies. To complete our understanding, we must know the nature of the disturbances caused by the underlying morbid conditions, how they excite increased activity, and what the relation is between this activity and the growth of the part. In the present state of our knowledge, in no instance can these requirements be completely met. This statement is again illustrated by the study of cardiac hypertrophy. In general, I believe that cell-growth attending work hypertrophy must start from physical or chemical changes in the muscle or gland cells, and is directly connected with increased function. Increased supply of blood or lymph is not a determining factor. The final result is the necessary consequence of the underlying morbid condition. We possess a satisfactory mechanical explanation for the essential steps in the process, and there is no reason to assume that other than mechanical factors are concerned in those manifestations not explained by known physical or chemical forces. Cell properties which determine the character of their response to changed conditions, are their well-known physiologic properties. The adaptation resulting is imperfect and not a complete compensation. Vascular hypertrophy and pathologic changes well exemplify the propositions stated. This is seen to great advantage in the study of the placenta and embryo.

Of paramount interest at the present time is the

¹ Abstract of presidential address delivered before the Congress, May 5, 1897.

application of these conclusions to the study of inflammation. This still remains an unsettled question. Between purely clinical and purely pathologic and experimental views, antagonism exists. From the clinical standpoint, inflammation is harmful. The pathologist and bacteriologist find in its phenomena a struggle for self-preservation. Modern knowledge teaches that the response of the cells in inflammation is made necessary and inevitable by their innate properties. Some of these protect them in mechanical and other injuries. As a whole, inflammation is an adaptive pathologic process without special fitness to justify us in extravagant statements upon this subject.

In conclusion, I wish to emphasize the fact that the healing power of Nature is often, under the circumstances present in disease, most incomplete and imperfect. Treatment based upon the idea that Nature is doing the best thing possible and should not be interfered with, rests often on an insecure foundation. In the light of modern knowledge, there is ample scope for the intervention of the physician and surgeon.

LESIONS OF THE RETINAL VESSELS, RETINA AND OPTIC NERVE, ASSOCIATED WITH GOUT.¹

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At the meeting of the American Ophthalmological Society held in 1893, the writer presented a paper on "Gouty Retinitis and Neuro-Retinitis," in which he gave a somewhat detailed *résumé* of our existing knowledge of the changes produced in the vascular system by the influence of the gouty diathesis. For a full account of these changes, and of the investigations of various observers in this direction, he would refer to the above paper, which was published in the "Transactions of the American Ophthalmological Society" for that year. In the four years which have elapsed since the paper was published, the conclusions which the writer then reached have been strengthened, and he can speak still more positively of the changes in the retina and optic nerve, and in the retinal vessels, which are not infrequently met with in gouty patients.

The pathologic condition of the blood in gout does not always manifest itself in a way that readily attracts attention, and this is particularly true in regard to the eye. Most authors who refer to retinal complications, occurring in the course of gout, mention only a hemorrhagic retinitis as being the most frequent retinal complication. I do not think that there is any doubt as to the existence of a gouty re-

titis or neuroretinitis, which strongly resembles certain types of syphilitic retinitis, and which may or may not be accompanied by retinal hemorrhages and opacities in the vitreous humor. The occurrence of retinal hemorrhages is easily explained, for it is well known that gouty persons are prone to hemorrhages, venous obstruction, and irregularities of the circulation, due to great arterial pressure and a relaxed condition of the vascular walls; vitreous opacities may be present in these cases. Such hemorrhages may involve one or both eyes, and are of sudden onset. Small linear and flame-shaped extravasations of blood may be scattered all over the fundus. At the same time, the optic discs may be hazy, and the retinal veins engorged and tortuous.

The effects of the poison of gout upon the vascular system are: (1) A high blood pressure in the arteries; (2) hypertrophy of the left ventricle; (3) hard incompressible arteries undergoing atheromatous degeneration.

The influence of gout in the development of arteriosclerosis and endarteritis is now well-established. Arterial degeneration is hereditary in certain gouty families, and signs of arteriosclerosis are very often the first symptoms of the hereditary malady. Most of our knowledge of this condition of the arteries has been gained from Thoma's investigations, and we now recognize the fact that arteriosclerosis is caused by some general disturbance of nutrition, which is partly the result of infection, intoxication, and other pathologic lesions as yet but little understood, and partly the accompaniment of senile changes. We learn from Thoma that gout may be looked upon as the remote antecedent of endarteritis, and that the latter condition is by no means always reached through the medium of interstitial nephritis.

Changes in the constitution of the blood current, such as are met with in gouty patients, would be very likely—in fact, almost certain—to develop obstructive circulation in the capillary system. This condition of the capillary circulation must cause some change in the blood current in the arteries. Whenever the current is slow, the middle coat of the artery usually contracts, and when this does not occur, a new growth of connective tissue is developed in the tunica intima, which thus reduces the arterial caliber. The muscular coat of the artery first becomes involved, and the loss of elasticity permits the artery to dilate. As a result, the blood current becomes slow, the vasa vasorum are distended, and a new growth appears in the intima, and is followed by the same process in other coats. A similar condition is met with in the veins, and, in fact, the phlebosclerosis or endophlebitis may precede the endarteritis sometimes by a lengthy period. Both

¹ Read at the Fourth Triennial Congress of American Physicians and Surgeons, Washington, D. C., May 4, 1897.

these conditions, endarteritis and endophlebitis, are found much more frequently in the retina of persons who suffer from chronic, non-inflammatory, atypical gout than in those who are afflicted with the typical inflammatory form of the disease, and the same thing is asserted to be true of the types of interstitial nephritis. One of the results of this retinal endophlebitis is edema of the retina, which is one of the constant symptoms in the early stages of the disease. The circulation may become reestablished through the obstructed vessels, in which case this edema disappears; but if the obstruction to the blood current becomes permanent, the distant venous branches become dilated, and in places varicose. The hemorrhages which are met with are due to local softening of the vascular wall, or to the rupture of these minute varicose dilatations. They may be of all shapes and sizes—small and punctate, linear or flame-shaped—and may be scattered all over the fundus.

The scope of this paper is limited, and is confined to a consideration of the changes in the retinal circulation, in the retina itself, and in the optic nerve, as seen with the ophthalmoscope. The literature on the subject is very scanty. None of the older authors mention retinal complications in gout, and until very recently none has been made of any changes in the retinal vessels. Gauté (*Thèse de Paris*, 1881) speaks of a gouty retinitis resembling syphilitic retinitis, which may or may not be accompanied by opacities of the vitreous and retinal hemorrhages. Lychon (*Thèse de Paris*, 1885) mentions neuroretinitis and intra-ocular hemorrhages as being due to gout. Nettleship ("Diseases of the Eye," fourth edition, 1890) says: "Hemorrhagic retinitis is more commonly met with in gouty persons than in others. It may be unioocular or binocular. The children or descendants of gouty persons, without being themselves subject to gout, are liable, in early life, to this insidious form of eye disease." This view is confirmed by Jonathan Hutchinson. Gowers ("Medical Ophthalmology," 1890) speaks more positively in regard to retinal lesions in gout. He thinks that the characteristics of these cases are a greater degree of disturbance of vision than corresponds to the visible changes in the fundus, the tendency to irregular defects in the field of vision, and the presence of lesions of the retina and optic nerve of the other eye induced by a symmetrical morbid process. Galezowski (*Annali di Otolmologia*, XIX.) believes that the changes begin in the retina and extend to the choroid, giving rise to a retinochoroiditis, characterized by an alteration in the vessels and deposits in and outside their walls. All around the macula and along the vessels are brilliant patches of exudate. The inflammatory process occupies the central zone of

the fundus, develops slowly, usually involves both eyes, and never ends in total blindness, as the periphery of the retina is rarely affected.

In the *Bericht der 25ten Versammlung der Ophthalmologischen Gesellschaft*, Heidelberg, 1896, Wagenmann has a very interesting article on "Eye Diseases in Gout," in which he admits that the diagnosis is not always easy in cases of atypical gout. After a careful study of the subject, he is convinced that the blood current containing an excess of urates irritates and inflames the tissues; or else the uric acid and other products of animal combustion are extravasated in minute quantities in the tissues. The inflammatory process may be so marked that relatively large deposits appear in the tissues. The origin of these deposits in the eye is best explained by the Ebstein theory, according to which the blood with excess of urates sets up an inflammatory process in places where the circulation is slow. The well known changes are seroplastic inflammation, and a deposit of what Wagenmann calls "concrements." This is undoubtedly the cause of the patches of exudation, the numerous small hemorrhages, the narrow arteries, and the marked venous hyperemia seen in the retina, and also of the recurrent vitreous opacities, which are often of a distinctly hemorrhagic character. In the discussion which followed this paper of Wagenmann, Nieden, in agreeing with the author of the paper, stated that he regarded the recurring retinal and vitreous hemorrhages as almost pathognomonic of gout. Pflüger and Hirschberg also endorsed the views entertained by Wagenmann, and the latter called special attention to the presence of glistening inorganic deposits in circumscribed patches irregularly arranged around the macula lutea in gouty patients.

In my paper, previously referred to, the detailed clinical history of five cases, and the reports of two autopsies, were given, with the results of the microscopic examination of the retinae and optic nerves. In the four years which have elapsed since that time, I have added to my data on the subject the histories of ten other cases, with the report of one autopsy.

The lesions to which I wish to call the attention of the Congress are: (1) The changes in the walls of the blood-vessels of the retina, choroid, and optic nerve, including arteries, capillaries, and veins. (2) Retinitis of a peculiarly localized character, confined to the posterior zone of the fundus, with or without hemorrhages in the retina and vitreous, and characterized by a peculiar yellowish exudation, occurring in clearly defined patches. (3) Optic neuritis, generally with, but sometimes without, an accompanying retinitis.

The clinical history of the ten additional cases, on

which this paper is based, resembles very closely that of the five original cases reported in the first paper, and the main facts are briefly repeated here. The subjective symptoms consisted in a deterioration of the vision, at first for small-sized type, but later for all objects at any distance, and a certain degree of photophobia, most marked for artificial light. The ophthalmoscope shows more or less marked blurring of the outlines of the optic discs, resembling the first stage of papillitis, but without the edematous swelling. The retinal arteries are diminished in caliber, in some places the lumen being reduced to the merest thread, and requiring the closest examination to see the minute blood column that still exists. The white lines along the vessels, both arteries and veins, are broad and distinct, and extend from the center of the papilla well out toward the periphery of the fundus. Occasionally the veins in places seem dilated like a fusiform aneurism, the vessel on both sides of the dilatation being reduced in caliber. Yellowish-white patches of exudation, at first brilliant but subsequently becoming dull, of varying size and shape, are seen grouped mainly about the region of the macula and disk, but with no systematic arrangement. These patches of exudation are entirely in the inner layers of the retina, as proved by the microscope. If hemorrhages are present, they are linear or flame-shaped in character, occur close to the vessels, both arteries and veins, and while mainly grouped around the posterior pole of the eye, are sometimes found scattered all over the fundus. If opacities of the vitreous are present, they are of the floating variety, are small and of varying shape, and may be either the result of previous hemorrhages, or an evidence of coexisting choroiditis. The ophthalmoscopic picture in these cases is that of general retinal angiosclerosis, with the addition of the glistening patches of exudation in the retina.

These patients had all shown signs of extensive degeneration of the walls of the blood-vessels throughout the body, notably in the temporal and radial arteries. Their urine was usually of moderately high specific gravity, ranging from 1020 to 1026. It was loaded with uric acid and phosphatic acid crystals. I have occasionally found a little albumin, but never any sugar or casts.

Of the five patients whose cases were originally reported, two died previous to the presentation of the first paper, and the results of the autopsies have been published. Since then two other patients have died (Cases II. and III.), both of cerebral hemorrhage. The other patient (Case I.) is still living, and possesses enough vision to assist him in going about. Of the ten patients seen since the presentation of the first paper, three have died, one

from pneumonia and two from cerebral hemorrhage. I was fortunately able to secure an autopsy in one of the latter cases, and was permitted to remove the posterior part of the eyeballs and the optic nerves for examination. The results of the microscopic examination were almost identical with those of the two cases previously reported. Sections made of the retina, choroid, and optic nerve showed very extensive angiosclerosis. The adventitia and media were decidedly thickened, but the main increase was in the intima, which in many places was so marked as almost to obliterate the lumen. The proliferation in the adventitia was largely granular, while the thickening in the intima was mainly due to hyalin deposit. Numerous fusiform aneurismal dilatations were found in the arteries, almost always at the point of origin of a branch; and on the distal side of these dilatations the caliber of the vessel was markedly narrowed. There were a number of hemorrhages, always close to the vessels. The nerve fibers on the papilla and in the retina were markedly varicose, and the spaces between them were filled by finely granular matter. In the retina the nerve-fiber layer was thickened by infiltration with a mass of fine granules, aggregated in heaps, with occasional distinct cells filled with the same granular contents. These masses of fine granules extended through all the layers of the retina except that of the rods and cones, most of them, however, being in the nerve-fiber layer. Sections of the optic nerves at various points as far back as the chiasm showed the same changes in the walls of the blood-vessels, and more or less marked varicosity of the nerve-fibers, and small masses of fine granules. The choroidal blood-vessels showed the same changes of general angiosclerosis. No patches of exudation were found anywhere in the choroid, such as existed in the retina.

The following brief conclusions have been drawn from the cases presented: (1) The changes in the fundus are always bilateral, though rarely symmetrical in the two eyes. The lesions may begin simultaneously in the two eyes, but this is by no means always the case. (2) The degenerative changes in the walls of the blood-vessels, both arteries and veins, are at first very minute, and are often overlooked. They must be carefully searched for, as they begin in the intima. (3) The general angiosclerosis, and the patchy exudation in the retina, cause marked impairment of central vision, but little impairment of the peripheral vision, and the disease never ends in blindness. (4) The loss of central vision is always progressive up to a certain point. Improvement of the vision, after the retinal disease is established, cannot be expected, though in favorable cases the existing vision may be maintained. (5) Hemor-

rhages into the retina are rare except in the comparatively early stages of the disease. When the vessels lose their elasticity by reason of the increase in the thickness of their walls, due to the deposits, the vessels become stronger and more rigid, and hemorrhages are no longer to be feared. (6) The most marked feature in the ophthalmoscopic picture is the development of the angiosclerosis in the vessels of the retina. This condition is confirmed by the microscope, and is seen to extend to the vessels of the optic nerve and choroid. (7) Another almost equally marked symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye, and generally leaving the macula intact until late in the course of the disease. This exudation is shown by the microscope to be mainly in the nerve-fiber layer, though found in all the layers except that of the rods and cones. (8) The changes in the optic nerve-fibers seem to be generally intra-ocular, but have been traced occasionally for some distance back of the eyeball.

THE DOCTRINE OF THE INTERNAL SECRETORY ACTIVITY OF GLANDS IN RELATION TO THE PATHOLOGICAL ANATOMY OF SUNDRY MORBID CONDITIONS.¹

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DIABETES, ADDISON'S AND GRAVES' DISEASE, MYX-
EDEMA, CRETINISM, AND ACROMEGALY.

MORBID anatomy alone can tell us singularly little concerning alterations in function. The existence of lesions recognizable to the naked eye or under the microscope may support conclusions reached by other means. It can do little more. We know from experiment that three-quarters of the liver, for example, may be removed from the healthy animal with no pronounced disturbance of the bodily functions; that whenever one-fifth or less of the pancreas is left in the dog it may be weeks before diabetes shows itself; that only when fifteen-sixteenths of the thyroid is removed may the dog succumb. In this enormous reserve of material and force may truly be said to lie the secret of the continued existence of living beings. Thus the mere fact that the greater part of an organ is found wanting by the anatomist, or replaced by tissue of another nature, is not in itself absolute evidence that what remains of the organ is functionless or incapable of meeting the needs of the organism.

Another matter which must be taken into account,

one that until now has received scant attention, is the existence of vicarious activity. Because one organ is seriously diseased it does not follow that the organism as a whole exhibits disturbances commensurate with the lesions in that organ; other parts may vicariously fulfil its functions. We have the well-known example of total extirpation of so important an organ as the spleen being succeeded by continued good health. Here, presumably, the lymph-glandular tissue in general takes up the functions of the absent organ. There is the compensatory development of the parathyroids in athyrea, and further, the frequent, but not constant coexistence of atrophic disease of the thyroid and hypertrophy of the pituitary to which Boyce and Beadles have more especially called attention. Similarly and curiously we meet with frequent persistence or enlargement of the thymus when either the thyroid or the pituitary body is the seat of disease. In passing, I may suggest that vicarious activity affords a possible explanation of the not infrequent cases in which we have the eventual coexistence of more than one of the diseases under consideration. If, for example, the thyroid be the seat of atrophic disease the compensatory hypertrophy and over-action of the pituitary may lead to eventual affection of that organ.

Yet another consideration, seriously weighing upon the morbid anatomist, is that two opposite processes may produce a similar symptomatology; one that he can recognize, another that he cannot. If the glands afford an internal secretion entering the lymph and so eventually circulating through the system, we know that the ultimate use of the secretion must be to effect a chemical transformation of some substance in some other part or parts of the system. There are thus four possible conditions: (1) Production of an insufficient amount of internal secretion of any gland in consequence of disease of that gland, and (2) the assimilation or production of an excess of that substance which normally is acted upon and transformed by the internal secretion in question. In both cases there will be a heaping up of the substance in the system; in both cases there may be the same train of symptoms. In the one case the gland or glands may show the clearest signs of disease; in the other they may appear normal. The morbid anatomist may in time discover collateral disturbances distinguishing these two states; at present he cannot adequately. In one case of diabetes he finds the pancreas unaffected; in the next it is extensively diseased. Unaided by experimental pathology, he is quite incapable of determining the important rôle played by this organ in regulating the sugar supply of the organism and in the production of diabetes. Similarly there may be an accumulation of the in-

¹ Abstract of a contribution to the discussion upon "Internal Secretions," at the Fourth Triennial Congress of American Physicians and Surgeons, Washington, D. C., May 5, 1897.

internal secretion, either due to (3) hypertrophy of a gland, or (4) not associated with recognizable glandular change.

It would seem that we have to deal with:

CHANGES ASSOCIATED WITH SYMPTOMS OF DISEASE.

I. Relative glandular inadequacy. Excess of substance acted upon by the internal secretion of a gland, without due compensation.

1. Altered condition of gland leading to diminished activity and diminished internal secretion.

2. No disease or alteration of gland but excessive production or assimilation of the substance acted upon by the internal secretion.

II. Relative glandular over-activity. Excess of internal secretion.

1. Altered condition of gland leading to increased activity and increased pouring out of internal secretion.

2. No disease or alteration of gland, but diminished production or assimilation of the substance acted upon by the internal secretion of that gland.

CHANGES UNACCOMPANIED BY SYMPTOMS OF DISEASE.

III. Compensation. Lesions of gland or altered systemic condition unaccompanied by symptoms.

1. Altered condition of gland leading to (a) increase or (b) diminution of internal secretion, with due compensation.

2. (a) Increased or (b) diminished production after assimilation of substance acted upon by internal secretions, with due compensation.

Let me here emphasize the fact that I do not pretend that this table includes every possible condition leading to local or general disturbance of these glands affording an internal secretion, and leading to the symptoms most often associated with disease of these glands. For example, we know from experiments with phloridzin that glycosuria may, among other things, be the result, not so much of increased production of sugar as of increased removal of this body through the kidneys. Such cases are not embraced in this table. Again, what I may term compound cases, as, for instance, of glandular inadequacy, in part from disease, in part from increased production of the substance acted upon by the secretions, are presented only by implication. All I urge is, that this table, conforming with what experiment has shown may occur, may very possibly be utilized to explain the apparently contradictory revelations of the *post-mortem* room.

THE PANCREAS AND DIABETES.

Much more than a century has passed since attention was first called to the pronounced changes to be seen in the pancreas in some cases of diabetes. We

all know that not until 1889, when Von Mering and Minkowski in Germany, and de Dominicis in Italy, published the results of their researches did the belief in the existence of a pancreatic diabetes begin to become generalized, but even at the present moment the fact that two cases, closely resembling each other clinically, may, *post-mortem*, show, the one, extensive pancreatic disturbance, the other, an apparently healthy pancreas, will create great confusion.

We have at least three careful studies upon this subject, those of Hansemann, Williamson, and Dieckhoff, and all demonstrating that three conditions may be distinguished: (1) extensive pancreatic disease with associated diabetes; (2) extensive pancreatic disease without diabetes; (3) diabetes unassociated with recognizable pancreatic disease. Hansemann, from a careful investigation of the records of the Pathological Institute and the Augusta Hospital at Berlin, found that the first condition (of pancreatic disease with diabetes) is more common than the two others combined. It may be that in Berlin the consumption of much beer predisposes to the pancreatic form of the disease; it may be that the material upon which Hansemann worked was imperfect to this extent, that full care was not taken to distinguish between extensive and extreme destruction of the pancreatic tissue; but it will, I think, be the experience here, as it was of Williamson in England, and Dieckhoff in Rostock, that advanced pancreatic disease, associated and unassociated with diabetes, are to be encountered the one but little more frequently than the other.

This much, however, stands out very prominently, that where in diabetes the pancreas is found affected, the morbid process within the gland is some one or other form of atrophy and destruction of the gland substance. Most commonly it is a form of periacinous fibrosis, originating, it would seem, secondarily to arteriosclerosis, in which, with thickening of the arterial walls, there is malnutrition of the gland cells, atrophy, and, what I have elsewhere termed, replacement fibrosis. Other forms of atrophy and fibrosis have not infrequently been observed—simple atrophy, congenital syphilitic fibrosis, obstruction of the ducts with calculi, dilation of the ducts and atrophy of the gland tissue, and scirrhus cancer of the pancreas; and I have found recorded five cases of necrosis, or hemorrhagic necrosis (two by Fitz and a third, a case under Drs. Bell and Finley, in my own experience at the Montreal General Hospital).

There can, therefore, be no question that the pancreatic lesions found in some cases of diabetes are such that there must be a marked diminution in the

secretory activity of the gland. To this extent, in this one class of cases, the results of autopsies are clearly in accord with the results of experiments. We have here examples of relative glandular inadequacy, brought about by altered conditions of the pancreas leading to diminution of internal secretion.

Examples of diabetes unassociated with disease of the pancreas are so well known that I need but refer to them. While such are difficult to explain, from purely anatomic considerations, the fact that they are found, and found relatively frequently, is, in itself, an evidence that glycosuria is of at least a two-fold origin. That they are found is in conformity with the results of experiments—experiments which, on the whole, must be regarded as proving that there can be heaping up of sugar in the organism beyond the transforming power of the pancreatic internal secretion, or otherwise an incomplete burning up of the sugar. If this heaping up be in general due to increased glycogenesis, increased production of sugar, we should expect to find some evidence of increased activity of some glycogenetic organ; and here the recent researches of Glénard and Triboulet tend to show that this may be the case. Contrary to the older and generally accepted teaching, Glénard finds that, clinically, in over sixty per cent. of diabetics there is evidence of some hepatic enlargement. Anatomically, he finds that three conditions may be recognized, each possibly a stage in one morbid process, namely, hyperemia, general cellular hypertrophy (hyperplasia), and hypertrophy with cirrhosis (hypertrophic cirrhosis). Thus, while I will not say that anatomic considerations prove the existence of my second subgroup in this connection, I must point out that the existence of this class of cases of diabetes, without adequate recognizable pancreatic disturbance, is best explained on the supposition that there may be excessive production or assimilation of sugar, with accompanying relative pancreatic inadequacy.

There is yet a third group of cases to be considered—that of extensive atrophic disease of the pancreas without diabetes. Here we have to proceed cautiously in our reasoning. As I have already indicated, Sandmeyer has found that if only one-fifth to one-ninth of the organ be left in the dog, it may be months before sugar appears in appreciable quantities in the urine. Vaughan Harley gives an even smaller amount, namely, one-fifteenth; but evidently he refers not to the eventual development of diabetes, but to its onset within a few hours. We can thus state that so long as from one-ninth to one-fifteenth of the glandular tissue of the organ is functional, for so long glycosuria need not manifest itself in the dog. There is no valid reason why we should not

apply these facts to the human being. Hence, so long as a very small proportion of fairly healthy gland tissue is left, we have a satisfactory explanation of why diabetes should not show itself, even though the major portion of the pancreas exhibits fibroid and atrophic or neoplastic changes. There are, however, aspects of the subject not capable of so simple an explanation. Again, Hansemann has called attention to cases of complete replacement of the normal pancreas by a diffuse cancerous infiltration. He seeks to explain these by the hypothesis that the cells of a primary new growth of a ductless gland may continue to furnish an internal secretion. This may or may not be the case. A more simple explanation of these and other examples of complete, or almost complete, destruction of the pancreatic glandular tissue is that of compensation, whether by vicarious function of Brunner's and other glands (the duodenal glands have frequently been found enlarged) or by diminished assimilation or production of sugar.

THE SUPRARENAL BODIES AND ADDISON'S DISEASE.

We meet with an identical series of cases in connection with another organ in which, experimentally, the existence of an internal secretion has been fully demonstrated. We may have (1) Addison's disease associated with disease of the suprarenal bodies; (2) Addison's disease with intact suprarenals; and (3) extensive, if not complete, destruction of the suprarenal bodies without the symptoms of Addison's disease.

Here, as with the pancreas in diabetes, the affection of the gland in Addison's disease is some form of atrophy or destruction of the specific gland tissue. Most frequently, I need scarcely say, the change is tuberculous and necrobiotic, resulting in the disappearance of the gland tissue, and its replacement by caseous material. But cases are on record of simple atrophy, hemorrhagic necrosis, and malignant growth of the bodies associated with or leading to all the symptoms of Addison's disease. In the vast majority of cases both glands are affected, but cases are on record (I have come across one such) where only one of the bodies has been the seat of recognizable disease. Of the three conditions above mentioned the most frequent found is the association of the disease with complete, or almost complete, destruction of the gland. So frequent is the association that the attempts to explain away the other two rare states of Addison's disease with intact suprarenal bodies and suprarenal disease without the Addisonian symptoms have been almost painful in their ingenuity. Yet undoubtedly well-authenticated cases are on record of both of these conditions.

We have in this connection singularly full statis-

tical collections of cases. That of Lewin is well known; he collected accounts of 285 cases, of which 211 showed caseous lesions of the suprarenals (seventy-four per cent.). Gilman Thompson found an even greater proportion of either primary or secondary tuberculosis (eighty per cent.). In the remaining twenty per cent. there were either other forms of atrophic disease or absence of recognizable disturbance.

The existence of cases of Addison's disease without obvious disease of the suprarenals is generally acknowledged. Lewin found that as many as twelve per cent. of his cases were of this type. The explanation generally given is that in these there had been alterations in the neighboring semilunar ganglia and abdominal sympathetic. Certainly, disturbance of the nervous system, and especially of the sympathetic, does lead to pigmentation of the skin. We see this in cases of hysteria, and again in Graves' disease, in which, from whatever cause, we have most marked nervous changes; but I must confess that I feel some little impatience toward the upholders of this semilunar ganglion theory of Addison's disease, for scarce two of them describe the same order of lesions. Most of the changes described would appear to be quite common in the adult dying from other causes; thus Hale White found that, examining thirty-three semilunar ganglia removed indiscriminately, if we leave out of account three perfectly normal taken from young children, twenty-four, or eighty per cent., of the remainder exhibited more or less extensive degenerative changes, with frequent presence of granular masses of pigment.

Under the circumstances, therefore, I see no valid reason why cases in which the bodies are found apparently unaffected may not, in the light of our present knowledge, be most satisfactorily classed as possible examples of relative glandular inadequacy of the second order. This suggestion may to some appear revolutionary; but let me reiterate my main argument: We acknowledge that glands like the suprarenals produce an internal secretion; we must inevitably admit that the function of such secretion is to affect a chemic transformation of some substance or substances distributed in other parts of the body. We must admit that when, for example, the suprarenal bodies are diseased, or removed, some, at least, of the symptoms that follow are due to the absence of the internal secretion, or, in other words, are due to the accumulation in the system of the substance or substances acted upon by the internal secretion. The same symptoms must be produced whatever the cause of the accumulation of the substance or substances, whether by diminution of the internal secretion or by excessive production or

assimilation of the aforesaid substance or substances. When, therefore, a morbid condition, such as diabetes or Addison's disease, which may be caused by destruction of a gland, is found to exist without recognizable disease of that gland, a very possible explanation of the condition is what I have termed relative glandular inadequacy due to excessive production or assimilation of the substance acted upon by the internal secretion. I would but ask you clearly to picture this: That in diabetes and Addison's disease it is not the internal secretion that causes the symptoms, but if experimental data are to be trusted, the lack of the same—and that this lack may be absolute or relative.

A few words only are necessary concerning affections of the suprarenal bodies without symptoms of Addison's disease. If bronzing be required as the one essential symptom, then cases of tuberculous disease of the suprarenal without "Addison's" are fairly frequent. Addison himself noted this condition. We must, however, it seems to me, acknowledge, with Chvostek and numerous earlier writers, that bronzing is but one of a group of symptoms, even though we are not prepared to accept Bedford Fenwick's suggestion that bronzing is especially connected with disease of the cortical layer. Leaving this category out of consideration, cases of extensive atrophic or neoplastic disturbance of both suprarenals without Addison's disease are few in number—far fewer than the cases of extensive pancreatic disease without diabetes; and in general the descriptions given are not sufficiently exact to be relied upon. Nevertheless, they exist. Greenhow apparently met with a case of almost complete atrophy without symptoms, and, in 1050 autopsies, upon subjects dying from diseases other than Addison's. Rolleston met with an example of caseation of the right and atrophy of the left suprarenal and with three cases (under the age of forty-five) in which both were peculiarly small. All these were without symptoms during life. There are more frequent examples recorded of cancerous growth destroying both bodies without noticeable symptoms. There is a possibility that the new growth here was so rapid and so recent that symptoms had not time to develop. In the atrophic and tuberculous cases it is not so easy to accept this explanation. Therefore, I am inclined to believe that compensation may occasionally manifest itself in man as it does occasionally in animals which have suffered complete ablation of both organs.

THE THYROID GLAND AND MYXEDEMA.

From an anatomic point of view there is little for me to say in elucidation of the pathology of myx-

edema beyond the one all-important statement that, with very rare exceptions, there is discoverable a well-marked atrophy of the thyroid. About this all pathologists are agreed. In the majority of cases the atrophy is peculiarly extensive, the specific cells of the gland being replaced by fibrous tissue; in some it is not so far advanced and areas may be found, not merely of degenerated remains of the vesicular epithelium, but of vesicles which by the superabundant proliferation of their epithelium would seem to be undergoing a compensatory hypertrophy. Yet where these are present they are localized and few in number; the main mass of the organ shows atrophy. A few cases only are on record, like that of Gulliver, where there has been a cancerous metamorphosis or replacement of the parenchyma. That in these cases the myxedema is associated with diminished internal secretion of the gland is, I need scarcely say, substantiated by the good effects of treatment by thyroid extract or thyroid feeding.

It must next be asked whether myxedema can show itself with apparently intact thyroid, *i. e.*, whether there are any cases which may possibly be explained by excess of the substance or substances acted upon by the internal secretion of the gland. The literature is peculiarly silent upon this point. I can find no example of autopsies upon cases diagnosed clinically as myxedema in which the gland was found normal, or but little affected. I can only recall an autopsy upon a patient of Dr. J. Stewart at the Royal Victoria Hospital, in which I found a large cancerous tumor of the pituitary. Here there had been a myxedematous swelling of the hands, and of other regions to less extent, without bony overgrowth, and no change was found in the thyroid. The condition, however, was not sufficiently advanced to deter Dr. Stewart from diagnosing tumor of the hypophysis. A somewhat parallel case (of apparent atrophy of the pituitary), in which the symptoms of myxedema were more marked, is recorded by Codd, but the anatomic details are given very briefly. Similarly we possess no exact records of atrophic disease of the glands unassociated with myxedema. I can only point out that it is not uncommon in the aged who show no signs that can properly be regarded as myxedematous—unless senility itself be regarded as such—to find a condition of very extensive chronic interstitial thyroiditis (as it may be termed) with arteriosclerosis, calcification, and hyalin changes, with retrograde or pseudo-embryonic type of vesicles. I have come across more than one case of this nature. There can be no doubt that here the secretory activity of the gland tissue must be very greatly reduced. If, however, we turn to cases in which by surgical means the equivalent of

complete atrophy, namely, complete thyroidectomy, has been attained, we then possess abundant evidence that the thyroid proper may be absent without myxedema necessarily intervening, and almost as abundant evidence from the more recent researches that the absence of symptoms is connected with vicarious activity on the part of other organs, and especially of the parathyroids. These may be regarded either as true accessory thyroid tissue, or as distinct organs, according to the point of view of the individual. Certainly when the thyroid is functional they do not acquire the full characters of thyroid tissue, but similarly there are often within the healthy organ scattered areas of embryonal tissue. This can be said with precision: that they are independent masses of tissue, apparently most closely related to the thyroid, which are at times capable of development to, or toward, the adult type of the gland, and of assuming vicarious functions. In like manner the pituitary body can at times undergo very definite compensatory enlargement.

An interesting point in this connection, to which attention has been drawn by Rogowitsch, is that the rabbit, from which the thyroid can be removed with impunity, has a pituitary body relatively five times as large as that of the dog, in which ablation of the thyroid leads rapidly to symptoms of acute athyrea; or, more correctly, the relationship of thyroid to pituitary is 3 to 1 in the former, 15 to 1 in the latter animal.

On the whole, therefore, anatomic data in connection with myxedema and cachexia thyreopriva support and are capable of explanation by this doctrine that where glands afford an internal secretion, the development or non-development of symptoms of disease depends primarily upon the relative amount of internal secretion produced and of the substance or substances acted upon by the same.

CRETINISM.

Cretinism presents a far more complicated histologic picture—so complicated that Bircher argues with very considerable force that "cretinic degeneration, as also dwarfism and chondrodystrophia fetalis hypoplastica have no etiologic connection with the functions of the thyroid." Bircher, however, fails to recognize that if we accept the existence of an internal secretion, we must also admit the presence of substances upon which it acts, and he cannot see that widely contrasted anatomic conditions may lead to the same train of symptoms. We must, I think, abide by the experimental and clinical evidence that removal of the thyroid in the young leads to a condition undistinguishable from cretinism. This being so, we find that in some few

cases of typical cretinism the thyroid is completely absent, in a large number it is small, in a yet larger number, according to Von Eiselsberg and Kocher, there is a goitrous condition present, while, according to Bircher, the goiters may be of all possible forms, from simple hyperplastic through soft (parenchymatous) and cystic to fibroid. The only point clearly to be made out from Bircher's very destructive criticism is that while in several cases the thyroid has been found of normal size, apparently no case exists in which by microscopic observation it has been found of normal structure.

EXOPTHALMIC GOITER.

I will now briefly refer to the condition which presents a series of symptoms so remarkably contrasted with myxedema—which also anatomically presents an equal contrast. There is to be found in exophthalmic goiter, as Greenfield has shown, and as is now generally accepted, a characteristic hyperplasia of the thyroid parenchyma, complicated, it may be, in later stages, by increased fibrosis. The one question of immediate concern here, is whether from this we can safely deduce that there is accompanying increased internal secretion. As I have already hinted, I do not think that from anatomic considerations alone we can safely make this deduction. There is, however, an important fact in favor of such deductions, namely, the strong likeness between the primary glandular changes in Graves' disease and those described by Halsted and others as occurring in the compensatory hyperplasia of the thyroid after removal of large portions of the gland; and if, together with the anatomic changes, we consider the favorable effects which so often follow removal, destruction, or diminution in the blood supply of portions of the hypertrophied gland in this disease—of operations which must lessen the internal secretion—it is difficult to arrive at any other conclusion than that in exophthalmic goiter there is increased internal secretion, and that this plays a singularly important part in the development of the symptoms. Whether this be primary or secondary to lesions of the central nervous system—of the restiform bodies, for example, our present anatomic data are insufficient to decide—as again they are incapable of deciding whether the increased secretion is altered or unaltered in quality. I may here note that, as Joffroy and Achard have indicated, the symptoms of parenchymatous and adenomatous goiter are at times curiously allied to those of exophthalmic goiter. Indeed, together with Vanderweld and Le Boëuf, they hold, I think, without due cause, that there is nothing anatomic to distinguish the one condition from the other. That the one

condition may lead to the other is a matter of clinical experience. As Dr. Shepherd has pointed out to me, extirpation of the goitrous nodules or cysts leads to the almost immediate amelioration of the symptoms.

The development of exophthalmic goiter without hyperplastic alteration of the thyroid is a matter concerning which there is little anatomic evidence. I find one case recorded by Joffroy and Achard in which the gland was of normal size and, while not normal histologically, presenting nevertheless a series of changes wholly distinct from Greenfield's classic description. The vesicles, instead of being small and corrugated, were enormously distended; instead of absence, there was abundance of colloid material; in place of a columnar and proliferating epithelium, the lining cells were flattened. Not a few believe in the existence of Graves' disease without goiter. Among recent writers Buschan especially holds this view, but, save in the above case, I cannot find anatomic substantiation for the opinion. Clinically, Graves' disease without enlarged thyroid has very frequently been noted; in some cases enlargement supervenes, in others it does not, but there may well be increased activity of the gland without marked enlargement. All that can be said at present from this evidence is that apparently the condition does occur. So also evidence as to the occurrence of marked hyperplasia and presumably increased secretion without symptoms is not so full and precise as could be wished. I can only point out that if adenomatous nodules in the thyroid produce any internal secretion then, while many cases of adenomatous goiter show a train of symptoms somewhat allied to exophthalmic goiter, and while a few cases pass on to undoubted Graves' disease, many, on the contrary, appear to last for years without symptoms. And in autopsies upon those dying from diseases other than exophthalmic goiter, we find a wide variation in the condition of the thyroid, from atrophy on the one hand to a condition not far removed from what Greenfield and others describe in association with exophthalmic goiter.

THE PITUITARY BODY AND ACROMEGALY.

Finally, some few words must be said concerning that strange collection of symptoms and anatomic changes to which Marie has given the name of acromegaly. Yearly it has become more clearly recognized that the term indicates a definite disease, although there is a liability toward confusion with gigantism on the one hand, and on the other with the remarkable overgrowth of bone in certain cases of chronic disease (mainly of the lung) which again Marie was the first to group together under the title

—voluminous, and in other respects unsatisfactory—of hypertrophic pulmonary osteoarthropathy.

Here again the remarkable trio of conditions forces itself upon our notice; there may be acromegaly with disease of the pituitary, acromegaly with apparently unaffected pituitary and extensive disease of the pituitary without acromegaly. Where there is acromegaly, in by far the greater number of cases the glandular portion of the body is diseased. It is true that the condition is rare. Between 1890 and the present time less than thirty affected subjects have undergone *post-mortem* examinations. Out of 24 necropsies upon cases stated to be acromegaly, Tamburini, the latest collector, finds that in 17 (or over 70 per cent.) the pituitary has been found diseased. The remaining 7 are subjected by Tamburini to severe criticism, with the result that he rejects 2 on the ground that the condition had only been recognized clinically for a few months, and no microscopic examination had been made. He presumes that the time had not been sufficient for the development of naked eye changes. Three other cases he holds to have been osteoarthropathy. There remain two which he could not definitely reject and consequently classified as doubtful. So far as I can follow Tamburini, he is strongly of the opinion that morbid changes in the hypophysis cerebri are essential to acromegaly. The majority of observers do not accept this extreme view, and with them I am inclined to believe that here, as certainly obtains in diabetes and Addison's disease, there may be typical symptoms without recognizable involvement of the pituitary.

But granting this much, that in the majority of instances the gland is diseased, it is difficult to advance much further, for there is a curious discord concerning the exact nature of the alterations in the pituitary body. In about one-half of the cases, hypertrophy of the organ is described. Stroebe, Tamburini, Boltz, and others of later date conclude that the change is adenomatous; Marino, Dallemagne, and Gauthier describe a peculiar cystic degeneration, and Boyce and Beadles a cystadenoma, while in another of Dallemagne's cases and in Wolf's there was clearly sarcoma, and in Bury's a "glioma." What are we to conclude? Is acromegaly accompanied by an increased pouring out of internal secretion, or the reverse? Mere hypertrophy and possibly adenomatous overgrowth might lead to increase, but surely degenerative changes and sarcoma can have no such effect.

It is difficult to reason by analogy, and if we attempt this and seek to base any argument upon what occurs in disease of the gland, which anatomically is most closely related to the pituitary—namely, the

thyroid—we are led rather to the conclusion that acromegaly must be due to arrest of function of the former. That is to say, there is a certain correspondence between the changes occurring in the connective tissues, in myxedema, and those affecting the bone, and to some extent the subcutaneous connective tissues in acromegaly.

On the other hand, the pituitary is nearly always found enlarged and hypertrophied in general gigantism, as distinguished from this localized acromegalic gigantism. It is difficult to reconcile such general gigantism with diminished activity on the part of the enlarged hypophysis, while again the contrast may be pointed out between gigantism and cretinic dwarfism. Tamburini, and independently Massolongo, have attempted to coordinate the contradictory anatomic discoveries by suggesting that two stages of the disease may be recognized, a first in which the hypophysis undergoes hypertrophy, and is in overaction, which may give place to a second in which the hypertrophied tissue either undergoes atrophy or adenomatous or sarcomatous change. The suggestion is seductive, but for the present must be regarded merely as a suggestion.

Briefly, therefore, our knowledge in this connection is miserably inadequate, and experiments have so far been without result. We cannot say whether in acromegaly there is increased or diminished internal secretion. While the change in the pituitary appears often to be primary, we cannot with certainty lay down that this is the case. It has only to be added that if we admit that lesions of the pituitary are associated with acromegaly, we must also admit that compensation can occur, for there is considerably over a score of cases on record of hypertrophy, adenoma and cystadenoma of the organ, all of considerable size and presumably of long duration, which had developed without signs of the disease in question.

CLASSIFICATION OF ACUTE PERITONITIS.¹

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ACUTE inflammation of the peritoneum is produced by so many different causes and assumes such varied clinical aspects that it is extremely difficult to formulate a satisfactory classification of the condition. A discussion of its etiology, differential diagnosis, prognosis, and treatment, except upon the basis of a clear and comprehensive classification, is fruitless and misleading, and usually results in the

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deduction of erroneous and often dangerous conclusions. The classification should include the anatomy, pathology, and etiology of the disease to be of value in rendering a correct diagnosis and a reliable prognosis, and to enable the physician and surgeon to advise and apply effective therapeutic measures.

1. ANATOMIC CLASSIFICATION.

An accurate anatomic diagnosis is necessary for the purpose of locating the inflammatory process correctly or to trace the connection between it and the organ primarily the seat of infection. During the beginning of the attack and in cases of localized peritonitis, the inflammation can usually be located without much difficulty, while the reverse is often the case after the disease has become diffuse. The inflammation may commence and spread from either surface of the serous membrane, visceral and parietal.

a. Ectoperitonitis.—An inflammation of the attached side of the peritoneum is called ectoperitonitis. As compared with inflammation of the serous surface, this inflammation of the subendothelial vascular connective tissue is characterized clinically and pathologically by intrinsic tendencies to limitation of the inflammatory process. In infected wounds of any part of the abdominal wall in which the peritoneum is exposed but not perforated, the primary ectoperitonitis is occasionally followed by the extension of the infection to the serous surface through the lymphatics, or by the direct extension of the infective process through the tissues until it reaches the endothelial lining. Peritonitis of a visceral origin is always preceded by ectoperitonitis, whether the infection reaches the peritoneal cavity through a perforation or by aggressive extension of the infection from a primary focus through the tissues until it reaches the free peritoneal surface.

b. Endoperitonitis.—What is usually spoken of and described as peritonitis is an inflammation of the serous surface of the peritoneum, which, anatomically speaking, is an endoperitonitis.

c. Parietal Peritonitis.—Inflammation of the serous lining of the peritoneal cavity is called parietal peritonitis. It may occur as a primary affection in penetrating wounds of the abdomen, but more frequently is met with as a secondary disease in consequence of the extension of an infection from one of the abdominal or pelvic viscera, or perforation into the peritoneal cavity of a visceral ulcer or a subserous or visceral abscess.

d. Visceral Peritonitis.—Inflammation of the peritoneal investment of any of the abdominal or pelvic organs is known as visceral peritonitis. The inflammatory process is seldom limited to a single organ,

as during the course of the disease adjacent organs or the parietal peritoneum will surely become involved. In diffuse peritonitis the whole peritoneal sac and the serous covering of all the abdominal organs is affected. The nomenclature of visceral peritonitis is a lengthy one, as it includes all of the abdominal and pelvic organs from which, when the seat of a suppurative inflammation, may become the primary starting point of an attack of localized or diffuse peritonitis.

e. Pelvic Peritonitis.—Inflammation limited to the peritoneal lining of the pelvis and its contents is known clinically and anatomically as pelvic peritonitis. It is an affection almost entirely limited to the female sex, and in the majority of cases is caused by extension of gonorrheal infection from the Fallopian tubes, or a mild form of pyogenic infection from the uterus, its adnexa, or the connective tissue of the parametrium.

f. Diaphragmatic Peritonitis.—Inflammation of the under surface of the diaphragm is described as diaphragmatic peritonitis, and when it assumes a suppurative type and remains limited, leads to the formation of a subdiaphragmatic abscess. This acute localized form of peritonitis is usually secondary to suppurative affections of the liver and gall-bladder, and perforating ulcers of the stomach and duodenum.

2. ETIOLOGIC CLASSIFICATION.

The classification of peritonitis upon an etiologic basis is of the greatest importance and practical value. The nature of the exciting cause frequently determines the anatomic and pathologic varieties. It likewise has a strong bearing upon the prognosis, and often furnishes positive indications as to the methods of treatment which should be adopted. Peritonitis, like every other inflammatory affection, is always the result of infection with pathogenic microbes, usually of the pyogenic variety. The etiology must consider the different avenues through which the microbes find their way into the peritoneal cavity.

a. Traumatic Peritonitis.—Primary peritonitis has usually a traumatic origin; that is, the injury establishes a communication between the peritoneal cavity and the surface of the body or some of the hollow abdominal or pelvic organs, through which pyogenic bacteria enter in sufficient quantity and adequate virulence to cause an acute inflammation.

b. Idiopathic Peritonitis.—The occurrence of peritonitis without an antecedent injury or suppurative lesion is doubted by many. It is too early to deny *in toto* the existence of so-called idiopathic peritonitis, but future bacteriologic examinations of the inflammatory product will no doubt reveal a microbic cause in all such cases. As an isolated affection,

peritonitis is found most frequently in females during or soon after menstruation. It is probable that the pyogenic bacteria multiply in the blood which accumulates in the uterus and reach the peritoneal cavity through the Fallopian tubes. It is said to have occurred in consequence of exposure to cold, and is then known as rheumatic peritonitis. Occasionally it has been observed as one of the remote manifestations of Bright's disease, pyemia, and the acute eruptive fevers.

c. Perforative Peritonitis.—Perforation of an ulcer of any part of the gastro-intestinal canal, or of an abscess of any of the abdominal or pelvic organs, or of the abdominal wall into the peritoneal cavity, is by far the most frequent cause of acute peritonitis. Two important and frequent causes are appendicitis and suppurative salpingitis.

d. Metastatic Peritonitis.—This form of peritonitis occurs, like other metastatic affections, in connection with suppurative or infectious processes not connected with the peritoneum. In very rare cases it develops in the course of many of the acute infectious diseases, as scarlatina, smallpox, erysipelas, rubella, and even varicella. It also occurs frequently in the course of septicemia and pyemia.

e. Puerperal Peritonitis.—Peritonitis occurring in connection with septic diseases of the puerperal uterus has for a long time been known as puerperal peritonitis. The infection may extend from the endometrium through the Fallopian tubes, or it may follow the lymph channels or the thrombosed infected uterine veins. Infection through the lymphatics usually results in rapidly fatal diffuse septic peritonitis, while in thrombophlebitis there is a greater tendency to localization, unless the thrombi disintegrate and cause embolism and pyemia.

3. PATHOLOGIC CLASSIFICATION.

The pathologic conditions which characterize the different varieties of peritonitis necessarily must be considered in classifying this disease. The pathologic classification is based almost entirely upon the gross and microscopic appearances of the inflammatory exudation and transudation.

a. Diffuse Septic Peritonitis.—Every acute peritonitis is septic in so far that phlogistic substances reach the general circulation from the inflammatory lesion, and in that frequently the inflammation terminates in suppuration; but the term "septic peritonitis" should be limited to those cases of diffuse septic peritonitis in which, as a rule, death occurs in a few days, and before any gross pathologic conditions have had time to form. It is a disease that is almost uniformly fatal, with or without operative treatment, the patients dying from the effects of progressive

sepsis. The claim of operators to have cured such cases by laparotomy must be accepted with a good deal of allowance. The microbes which produce this form of peritonitis are those which follow the lymph spaces and are rapidly diffused not only over the entire peritoneal surface, parietal and visceral, but also through the subserous lymphatic channels. The disease is observed most frequently after perforation into the free peritoneal cavity of an abscess containing septic pus; rupture, or perforation of any of the abdominal or pelvic viscera containing septic material; gunshot or stab wounds of the abdomen with visceral injury of the gastro-intestinal canal; and occasionally as the result of infection during a laparotomy. The gravest form of puerperal fever is a diffuse septic peritonitis. The subjects of this variety of peritonitis die so soon after the beginning of the disease that at the autopsy no gross tissue changes are discovered. Besides a slightly increased vascularity, nothing is found to indicate the existence of peritonitis. The septic material, formed in large quantities and of great virulence, is rapidly absorbed by the stomata of the under surface of the diaphragm discovered and described by Von Recklinghausen.

b. Suppurative Peritonitis.—Suppurative peritonitis, that is, an inflammation of the peritoneum which results in the formation of pus, is always more or less circumscribed. This form of peritonitis is the most frequent, and is generally associated with more or less fibrinoplastic exudation. The pus is either serous or seropurulent, or may reach the consistence of cream, when it usually is of a yellow color. The accumulation of pus may be so large that upon opening the abdominal cavity it may appear as though the entire peritoneal cavity and all the organs contained within are implicated, but a careful examination will almost always reveal the fact that a large part of the peritoneal cavity and many of the organs were shut out from the inflammatory process by plastic adhesions. Suppurative peritonitis must therefore be regarded from a practical standpoint as a circumscribed inflammation. The appearance and character of the pus are often greatly modified by the admixture of an extravasation accompanying the perforative lesion which produced the peritonitis. If the pus is thin (serous) we speak of *seropurulent peritonitis*. It is a serous peritonitis with the formation of pus in sufficient quantity to render the serum more or less turbid. This subvariety of suppurative peritonitis is without exception in combination with fibrinous exudations, which tend to limit the extension of the infective process. Sedimentation of the solid constituents takes place, so that the fluid contains more of the solid constituents in the most dependent portion of the affected district.

c. Serous Peritonitis.—Independently of malignant and tubercular disease of the peritoneum, circumscribed hydrops of the peritoneal cavity is caused by a very mild form of peritonitis, the pus microbes present not being sufficient in quantity to produce pus. Patients usually recover rapidly from this form of peritonitis. The slight alterations of the peritoneum produced by the inflammatory process do not interfere with the transudation of serum, and resorption is effected as soon as the inflammation subsides and the normal absorptive function of the peritoneum is restored. Serous peritonitis is usually more or less complicated by fibrinous peritonitis, as fragments of fibrin are often found suspended in the blood. The serum is generally somewhat turbid, not transparent, and grayish-yellow or reddish in color. As long as the fluid is limited in quantity, it gravitates toward the most dependent parts of the abdominal cavity, in the small pelvis; when more copious, it reaches the upper portions of the peritoneal cavity and first seeks the depression on each side of the spinal column.

d. Fibrinoplastic Peritonitis.—The inflammation results in a plastic exudation with little or no effusion. The character of the exudate depends on the intensity and quality of the bacterial cause. The exudation is often so copious that it has been mistaken for malignant disease. The symptoms are marked cachexia, ascites, uncontrollable diarrhea, and apparent tumor deep in the abdomen. The exudation in the course of time contracts, and results in strong bands of adhesion, which frequently flex and distort the organs to which they are attached, which has given rise to another term—*peritonitis deformans*.

4. BACTERIOLOGIC CLASSIFICATION.

As the essential cause of peritonitis is always the presence and action of pathogenic microbes and their toxins upon the peritoneum, and as the character of the inflammatory process is largely influenced by the kind of microbes which produced the infection, a bacteriologic classification is of the greatest scientific and practical importance. All pus microbes present in sufficient quantity and virulence in the peritoneal cavity can produce peritonitis.

a. Streptococcus Infection.—The streptococcus pyogenes is the microbe which is most frequently found in the tissues in cases of septic peritonitis. The infection spreads so rapidly over the peritoneal surface and through the subserous lymphatics that death, as a rule, occurs from septic intoxication before a sufficient length of time has elapsed for any gross pathologic lesions to form. Absence of fibrinous exudate and effusion are the most striking negative findings at operations and necropsies.

Streptococcus infection is the immediate cause of the most fatal form of puerperal peritonitis. After the peritoneum has once been infected, rapid diffusion takes place, and finally the diaphragm and pleuræ are implicated in the same process, and the patient dies from the effects of progressive sepsis.

b. Staphylococcus Infection.—In peritonitis caused by staphylococcus infection the intrinsic tendency to localization of the disease is more marked; the inflammation results more often in circumscribed suppuration and limitation of the infective process by copious fibrinoplastic exudations. As a rule, the inflammation terminates in the formation of thick, cream-colored pus. Different forms of staphylococci are often seen in the same inflammatory product.

c. Pneumococcus Infection.—It is now well known that pneumonia is produced by different microbes, but the diplococcus is found in about eighty per cent. of all cases. It is this microbe which occasionally is found as the bacteriologic cause of acute suppurative peritonitis. Weichselbaum has found the diplococcus of pneumonia unaccompanied by any other micro-organism in three cases of peritonitis. In one case the peritonitis and acute pneumonia occurred simultaneously; in the other, double pleuritis followed the peritonitis, but in the last case the peritonitis was undoubtedly primary, and in the absence of any other microbes in the inflammatory product must have been caused solely by the diplococcus of pneumonia.

d. Bacillus Coli Commune Infection.—The bacillus coli commune, a microbe that constantly infests the intestinal canal, is in a fair percentage of cases the bacteriologic cause of acute peritonitis. This microbe possesses pyogenic properties, and in intestinal paresis and perforations escapes into the peritoneal cavity, and usually produces a pathologically mixed form of peritonitis—that is, suppurative and fibrinoplastic peritonitis.

e. Gonococcus Infection.—In the peritoneal cavity the gonococcus produces a plastic peritonitis, and sometimes localized suppuration. Salpingoperitonitis and the more diffuse pelvic peritonitis is most frequently caused by gonococcus infection.

f. Tubercular Infection.—The rapid diffusion of the tubercle bacillus in the peritoneal cavity, either through the circulation or by rupture of a tubercular abscess into the peritoneal cavity, or by extension from a tubercular salpingitis, occasionally gives rise to a form of acute peritonitis characterized as such in a modified way by the clinical manifestations which accompany it. According to the intensity of the infection, or the degree of susceptibility of the patient to the action of the tubercle bacillus, the disease assumes one of the following pathologic forms: (1)

Tubercular ascites. (2) Fibrinoplastic peritonitis. (3) Adhesive peritonitis. Suppuration takes place only when the tubercular product becomes the seat of a secondary mixed infection with pus microbes.

5. CLINICAL CLASSIFICATION.

A diagnosis for the careful physician and conscientious surgeon must include the location, extent, causation, and pathology of the disease. From the information obtained from the classification already made must be obtained the material upon which to base a clinical classification. Such a classification should serve as a guide in differentiating between the cases which demand surgical intervention and the cases which can be trusted to medical treatment.

a. Ectoperitonitis.—Abscess formation in the subperitoneal connective tissue, as seen most frequently in the pelvis in women, in the cavity of Retzius in men, and in the retroperitoneal space in both sexes, is always attended by inflammation of the under surface of the peritoneum. Such abscesses should be recognized and accurately located sufficiently early to prevent serious complications by an extraperitoneal incision and drainage; or, if the abscess is of a tubercular nature, by tapping, evacuation, and iodoformization.

b. Diffuse Septic Peritonitis.—This form of peritonitis is characterized clinically by the gravity of the general symptoms from the very incipency of the disease; pathologically, by the rapid diffusion of the infection over the entire serous surfaces, visceral and parietal; and, bacteriologically, by the presence in most of the cases of the streptococcus pyogenes in the inflamed tissues. Staphylococci, pneumococci, and the colon bacillus may also be the cause of rapidly spreading diffuse peritonitis. This form of peritonitis usually follows penetrating wounds of the abdominal cavity, complicated by visceral injuries of the gastro-intestinal canal, contusion or laceration of any of the abdominal or pelvic organs, rupture of an abscess or ulcer into the free peritoneal cavity, or the extension of a septic lymphangitis from any of the abdominal or pelvic organs to the peritoneum. Strict aseptic precautions have succeeded in greatly reducing, but not entirely eliminating, the danger from this source in all operations requiring opening of the free peritoneal cavity. In genuine cases of diffuse septic peritonitis surgical intervention is usually powerless in preventing speedy death from toxemia.

c. Perforative Peritonitis.—Perforative peritonitis is manifested by the sudden onset of the disease, by diffuse pain and tenderness, rigid abdominal walls, fever, and vomiting, and by the impossibility by inspection, palpation, or auscultation to ascertain in-

testinal peristalsis, the latter being almost positive proof of the presence of gas in the free peritoneal cavity. According to the author's observations, meteorismus peritonei in perforative peritonitis caused by affections of the appendix is rare, while he has seldom found it absent in perforations of any other portion of the gastro-intestinal canal. According to the number and virulence of the microbes which find their way into the peritoneal cavity with the extravasation, the resulting peritonitis is either diffuse or more or less circumscribed. The colon bacillus is invariably present in the inflammatory product, but, in addition, streptococci, staphylococci, putrefactive bacilli, the typhoid bacillus, or bacillus of tuberculosis, according to the nature of the primary affection, may also be found.

Perforative peritonitis must be regarded and treated as a strictly surgical disease. The primary lesion must be exposed and treated as soon as a diagnosis can be made, and the necessary measures applied to limit the extension of the infection and to prevent death from toxemia.

d. Circumscribed Peritonitis.—The symptoms appear suddenly, *i. e.*, are preceded by those incident to the primary disease. The severity of the pain and the extent of the muscular rigidity and tenderness will correspond with the extent of the disease. The intensity of the general symptoms are determined more by the nature and virulence of the microbic cause than by the size of the peritoneal surface involved. The inflammatory focus may be limited to a very small space, or it may involve the greater portion of the peritoneal cavity and organs which it contains. Circumscribed suppurative peritonitis is usually the result of infection with staphylococci, bacillus coli commune, and pneumococci. In fibrinoplastic peritonitis surgical interference becomes necessary only when intestinal obstruction is caused by the adhesions. In circumscribed suppurative peritonitis the pus should be evacuated as soon as the disease is recognized, and, if possible, by an extraperitoneal route.

ADDRESS ON THE UNVEILING OF THE BRONZE STATUE OF THE LATE PROFESSOR SAMUEL DAVID GROSS IN WASHINGTON, D. C.¹

By WILLIAM W. KEEN, M.D.,

OF PHILADELPHIA;

PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL
SURGERY IN THE JEFFERSON MEDICAL COLLEGE.

SAMUEL DAVID GROSS was born near Easton, Pa., July 8, 1805, and died in Philadelphia, May 6, 1884, having nearly completed his seventy-ninth year. His

¹ Abstract from the address delivered before the Fourth Triennial Congress of American Physicians and Surgeons, Washington, D. C., May 5, 1897.

early years were spent amid the rustic labors and healthful pleasures of a Pennsylvania farm. This gave him a strong and vigorous body, without which he never could have performed a tithe of the labor which preeminently distinguished his long life. Before he was six years old he determined to be a surgeon, and early in his professional studies to be a teacher. Yet when he was fifteen he knew scarcely any English. Brought up among the sturdy, honest, laborious Pennsylvania Dutch, he could speak that curious English-German. But his English, of which he became so fluent a master, and even pure German, which he began to study at the same time, were learned almost as foreign tongues, and as a result of his appreciation at that early age of his need for a better and wider education.

At seventeen he began the study of medicine as the private pupil of a country practitioner, but after learning some osteology with the aid of that tuppenny little compend, Fyfe's Anatomy, and a skeleton, he gave up in despair, for again he found his intellectual tools unequal to his work. Accordingly he stopped at once in his medical career and went to the academy at Wilkesbarre. At nineteen he began the study of medicine again—a study in which for sixty years his labors never for a moment ceased or even relaxed.

In 1828, at the age of twenty-three, he took his degree in the third class which graduated from the Jefferson Medical College. He opened an office first in Philadelphia, but soon removed to Easton. Nothing is more characteristic of the man than that, while waiting for practice, he spent hours daily in dissecting in a building he erected at the back of his garden, and provided himself with a subject by driving in a buggy all the way from Easton to Philadelphia and back; wrote a work on descriptive anatomy, which, however, he never published, and in eighteen months after graduation had translated and published Bayle and Hollard's "General Anatomy," Hatin's "Obstetrics," Hildebrand, on "Typhus," and Tavernier's "Operative Surgery"—works aggregating over eleven hundred pages. His motto was indeed "*Nulla dies sine linea*." His "stimulus," he himself says, "was his ambition and his poverty."

In 1833, five years after his graduation, he entered upon his career as a teacher—a career which continued for forty-nine years, till within two years of his death. This took him first to Cincinnati as Demonstrator of Anatomy in the Medical College of Ohio. In 1835 he became Professor of Pathological Anatomy in the Cincinnati Medical College.

His book on the "Bones and Joints" had appeared in 1830, and next, as the result of four-years' study

and teaching, his "Elements of Pathological Anatomy" was published in 1839. In 1840 he went to the University of Louisville as Professor of Surgery, and, excepting one year when he was Professor of Surgery in the University of the City of New York, he remained there for sixteen years, happy in his family, his students, his flowers, and his generous hospitality. He and his colleagues—Drake and Austin Flint—soon made it the most important medical center in the West, and he was in surgery the reigning sovereign. While there he published, in 1851, his work on the "Urinary Organs," and in 1854 another pioneer work, that on "Foreign Bodies in the Air Passages." His fame had become so great that he was invited to the University of Virginia, the University of Louisiana, the University of Pennsylvania, and other schools. But he was steadfast to Louisville until his beloved *alma mater* called him to the chair just vacated by Mütter. From 1856, when in his introductory he said, "whatever of life and of health and of strength remain to me, I hereby, in the presence of Almighty God and of this large assemblage, dedicate to the cause of my *alma mater*, to the interest of medical science, and to the good of my fellow-creatures," till he resigned his chair in 1882—nay, till his death in 1884—this was absolutely true. Even when the shadows of death were thickening he corrected the proof sheets of two papers on "Wounds of the Intestines" and "Lacerations Consequent upon Parturition," his last labors in the service of science and humanity.

Three years after he entered upon his duties at the Jefferson he published his splendid "System of Surgery"—a work which, though in many respects its pathology and its practice are now obsolete, is a mine of information, a monument of untiring labor, a text-book worthy of its author, and has been the companion and guide of many generations of students. From his removal to Philadelphia till his death, twenty-eight years later, his life can be summed up in a few sentences: daily labor in his profession, editorial labor without cessation for some years in managing the *North American Medico-Chirurgical Review*, the successor of the *Louisville Medical Review*, of which he had also been the editor; article after article in journals; address after address; twenty-six annual courses of lectures on surgery to thousands of students; labors without ceasing till he wrapped the drapery of his couch around him and calmly passed away.

In reviewing his life we may fittingly consider it from the standpoint of the surgeon, the author, the teacher, and the man.

As a surgeon he was painstaking, thorough, and careful in his investigation of a case, skilful as an

operator, and, having so vast an experience and equally extensive acquaintance with the wide literature of his profession, he was scarcely perplexed by the most difficult case, and rarely at a loss as to the proper course to pursue in the most unexpected emergencies. He was a practitioner of the old school, who always mingled medicine with surgery, and attributed much of his success in the latter to his experience in the former. His influence on the profession was marked and wholesome. He founded two medical journals, was the founder of the Pathological Society of Philadelphia and of the Philadelphia Academy of Surgery, the founder and first president of the American Surgical Association, and the first president of the Alumni Association of the Jefferson Medical College. It is peculiarly fitting, therefore, that these last two associations should unite to-day in erecting and unveiling the bronze statue of one who did so much for them and whom they rightly delight to honor.

As an author, his chief characteristics were untiring industry, comprehensiveness, methodical treatment of his subject, and a singular felicity of style, especially for one who acquired English so late and with difficulty. He "blazed" more than one new "trail" in the forests of surgical ignorance. In the early part, and even in the middle of this century, it was rare for an American to write a medical book. The most they did was either to translate a French or a German work, or to annotate an English one. He was one of the earliest to create an American medical literature of importance, and his works on the "Urinary Organs," on "Foreign Bodies in the Air Passages," and his text-book on "Surgery," gave a position to American surgery abroad which we can now hardly appreciate; while his "Pathological Anatomy" was the very first work in the English language on that most important branch of medicine. His experiments and monograph on "Wounds of the Intestines" laid the foundation for the later studies of Parkes, Senn, and other American surgeons, and have led to the modern rational and successful treatment of these then so uniformly fatal injuries. He first advocated abdominal section in rupture of the bladder, the use of adhesive plaster in fractures of the legs, amputation in senile gangrene, and the immediate uniting of tendon to tendon when they were divided in an incised wound. Had he lived but a year or two longer bacteriology would have shown him that scrofula was of tubercular origin, and not, as he so firmly believed and vigorously taught, a manifestation of hereditary syphilis.

That his eminence as an author should have met with recognition from scientific organizations and institutions of learning is no cause of surprise. It

made him the president of the International Medical Congress of 1876, a member of many of the scientific societies of Europe as well as America, and won for him the LL.D. of the University of Pennsylvania, and I believe the unique honor in America of having had conferred upon him the highest degree of all three of the leading universities of Great Britain—Oxford, Cambridge, and Edinburgh.

As a teacher he was earnestness itself. Filled to overflowing with his subject, his one desire was to impart to us as much of the knowledge he possessed as our young heads could hold. Repetition did not blunt the novelty nor time the attraction of his theme. His whole heart was in his work. Especially did he inculcate the principles of surgery, for he was convinced, and rightly, that one who was thoroughly imbued with these could not go far wrong in his practice. As a man, he was beautiful in his relations to his family, who were devoted to him with an affection that was unusually strong; upright in all his dealings, and despising cant and pretense and anything unworthy a true gentleman. Few men were more widely known in and out of the profession, and few ever had the good fortune to know intimately so many distinguished people of both continents. Wherever he was known he was respected, and by those who knew him intimately he was beloved.

Such, then, was the man whom we are gathered to-day to honor. The American Surgical Association, the Alumni Association of the Jefferson Medical College, and a few friends who have gladly united with us in this service of affectionate remembrance, have presented his statue to the people of the United States, to stand forever in our beautiful capital city as a mute yet eloquent evidence of our esteem for his personal worth and his professional attainments.

Yonder statue of Joseph Henry has stood alone for too many years. We have to-day unveiled its worthy companion. Both of them are memorials of men great in science, whose lives were devoted to the good of their fellow-creatures, to saving life, adding to human comfort, lessening pain, promoting knowledge, cheering the sick, and assuaging even the very pangs of the dying. We do well thus to honor in imperishable bronze the men who have won these victories of peace! To no one can the words of the blessed Master apply with greater force than to the kind surgeon whose time and thought and talents are given to humanity, and, above all, to the poor, with no payment but the grateful look of returning health and rescued life and that inward satisfaction which far surpasses all the wealth of the Orient—"Inasmuch as ye have done it unto one of the least of these, my brethren, ye have done it unto Me."

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SATURDAY, MAY 8, 1897.

THE MEDICAL CONGRESS AT WASHINGTON.

ELEVEN years have elapsed since the American Surgical Association first advocated the organization of a general congress of American physicians and surgeons that should assemble at certain stated intervals. The adoption of the plan marked an era in the medical affairs of this country, and now for the fourth time, by the session just brought to an end at Washington, the success attained has demonstrated its ever-increasing value. The component societies of the Congress embrace all the principal departments of medicine, and the membership of each includes men who stand at the head of the profession in their particular line of work. The Congress is a common meeting ground for all, and the clinician and the pathologist thus enjoy opportunities for the comparison of experiences that otherwise would be wanting.

The fourteen societies held individual meetings during the mornings, and in the afternoon all came together in general session. As a rule, the papers presented, and the discussions, were of an eminently scientific character, and in keeping with a much-to-be-desired conservatism.

One of the most interesting events of the Congress was the unveiling of the statue of the late Pro-

fessor Samuel D. Gross, which occupies a commanding position in the grounds of the Smithsonian Institute. Dr. Keen, in his address, paid a tribute to the memory of this famous American surgeon which will be appreciated by those whose good fortune it was to be associated with him.

The social side of the meeting was marked by many pleasant features, not the least of which was the reception at the Arlington Hotel on Wednesday evening after the address of Dr. Welch, the President of the Congress.

With the celebration of the semi-centennial anniversary of the American Medical Association at Philadelphia in June, and the meeting of the British Medical Association at Montreal in August, this Congress forms a galaxy of brilliant medical conventions that will signalize the season of 1897 as the epochal point of the closing years of the century. It is interesting to note, also, that this work will be supplemented by the coming International Medical Congress at Moscow, but in spite of the importance of the latter, it is more than probable that the practical suggestions that will be of most service to the profession of America will be found in the transactions of the three great societies that hold their meetings on this side of the Atlantic.

The report of the proceedings of the Fourth Triennial Congress, as published in this issue of the News, is especially full and complete, and in order to present it to our readers the number of pages of text has been increased to forty-two. The same enterprise that characterizes this presentation will be maintained in reporting the transactions of the American and British Associations.

ECHOES AND NEWS.

Officers of the American Gynecological Association.—At the recent meeting of this society at Washington, the following officers were elected for the ensuing year: President, Dr. Paul F. Mundé of New York; secretary, Dr. J. Riddle Goffe of New York; treasurer, Dr. J. M. Baldy of Philadelphia.

Sad Result of an Explosion at the Woman's Hospital, New York.—An explosion in the laboratory of the Woman's Hospital on the afternoon of April 29th resulted in the death of Dr. Leo Ross, the first assistant house surgeon, and the injury of Mr. A. S. Wolf, the druggist of the institution. While sterilizing a quantity of catgut in alcohol over a flame, the fluid ignited and was scattered over

the men. Mr. Wolf, with rare presence of mind, threw himself on the floor and smothered the flames by means of a coat which he wrapped about himself, but Dr. Ross ran across the yard and into one of the operating rooms, where an operation was in progress. Water was thrown upon him and his clothing removed as quickly as possible, but not before his body had been terribly burned. The unfortunate man died early on the following morning.

Obituary.—Dr. Traill Green of Easton, Pa., died in that city April 29th at the advanced age of eighty-four. Few physicians in Pennsylvania were so widely known and respected as Dr. Green, and his loss will be greatly felt. He was graduated from the Medical Department of the University of Pennsylvania in 1835, and in 1837 was appointed professor of chemistry at Lafayette College. Four years later he was called to the chair of natural sciences at Marshall College, and in 1866 the honorary degree of LL.D. was conferred upon him by Washington and Jefferson College. He was the first president of the American Academy of Medicine. He took a deep interest in all scientific matters, and his name has been connected with many famous works. A number of years ago he erected the Astronomical Observatory at Lafayette College at his own expense and presented it to that institution. In addition to a large number of pamphlets and addresses, he was the author of a work on "The Zoological Floral Distribution of the United States." To Dr. Green probably belonged the distinction of being the oldest continuous subscriber to one medical journal in this country. Under date of December 15, 1893, he wrote to the publishers of *The American Journal of the Medical Sciences* as follows: "For more than fifty years I have been a reader of your journal, and during all these years no journal has been received in my office which has been so welcome or so useful to me, and now as I am beyond four score years of age and about to retire from the active work of my profession, I desire to thank you for the help you have been to me."

SOCIETY PROCEEDINGS.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

Fourth Triennial Session, Held at Washington, D. C., May 4, 5, and 6, 1897.

[Specially reported for the MEDICAL NEWS.]

GENERAL SESSION.

FIRST DAY—MAY 4TH.

The first general session of the Congress was nearly a half hour later in assembling than the time announced in the program, and the audience was at first very small. This was due chiefly to the somewhat tardy adjournment of the sections which held meetings in the forenoon.

The meeting was called to order by DR. LANDON CARTER GRAY, of New York, Chairman of the Executive Committee, who, without formal address, remarked that those present who were familiar with the written and unwritten history of the Congress might feel proud at this

fourth meeting. The work done in the various component associations and the work to be done in this is sufficient evidence of the activity which is holding its own with the rivalry of the various medical congresses of the present time. After expressing thanks for the honor of having the privilege of opening the Congress, the speaker introduced the President, DR. WILLIAM H. WELCH of Baltimore.

Dr. Welch, in assuming the chair, remarked that he would follow the example of the Chairman of the Executive Committee and not make this the occasion for a formal address. The success of the Congress, he said, depends upon scientific work, of which the program promises an abundance. He also thanked the Congress for the honor conferred upon him by electing him to his office, as well as the officers of the Congress who had worked so faithfully in arranging the program, from the character of which he believed that their efforts would be well rewarded.

The chairman then announced a

BUSINESS MEETING

of the Congress, called in accordance with a resolution passed at the last meeting.

DR. WILLIAM K. SIMPSON of New York explained the nature of the business before the session.

Dr. Simpson stated that the question before the meeting was the consideration of a motion of Dr. White made at the last meeting and laid upon the table, but subsequently reconsidered and made the special order of business at this session. The motion was that the name Washington be stricken out of the by-laws of the Congress as the invariable place of meeting, and that it be left to the will of the Congress at each meeting to select the place for the next meeting.

DR. C. H. MASTIN moved that the question be laid upon the table. This was carried. Dr. S. C. Busey of Washington then moved that the vote just taken be reconsidered and that this present motion be laid upon the table. This motion was also carried.

GENERAL BUSINESS

being made the order of the day, DR. JOHN B. ROBERTS of Philadelphia offered a resolution to the effect that the Executive Committee be instructed to obtain reduced railroad rates for those desiring to attend future meetings of the Congress. Carried.

DR. S. C. BUSEY then reported that he had been instructed by a certain committee on vivisection now in session in this city, and composed of representative men from scientific, educational, and medical institutions, to report to this body and request such action as it may deem proper. A bill is now before the Senate which has been twice reported upon favorably. Twice this committee had strongly opposed the passage of the bill and they thought that their opposition had, in part at least, prevented the vote of the Senate. These two protests were simply scientific documents in favor of vivisection. They had, however, lost to the opposition some of its best friends and they felt that something more should be done, lest these lost friends might become open enemies. The speaker had recently addressed a letter to Senator McMillan, asking for an op-

portunity to appear before the committee to which the antivivisection bill had been referred, but the only reply was a statement that his letter had been received and referred to the committee. There is danger every day that the matter may be called up before the Senate and the bill enacted without further opportunity being given for opposition. Another difficulty heretofore was the fact that when a notice was given to any committee or individual to appear before committees of the Senate, sufficient time was hardly given for the person notified to get to the Capitol. He desired, therefore, that the Congress of Physicians and Surgeons should protest against the passage of the bill, in the hope that a protest from a body of such scientific prominence as this might carry more weight. He also requested that the Chair appoint a committee with power to take any action in its judgment proper for preventing the passage of this bill.

SURGEON-GENERAL STERNBERG corroborated the statement of the last speaker in regard to the lack of opportunity to prepare any defense when called upon by the Senate committee, and requested that the committee to be appointed by the Chair should consist of non-residents of Washington. He remarked further that the strongest possible resolutions against this bill had been presented to the committee of the Senate, but that it was very doubtful whether such resolutions were ever read by a large number of the committee and hence they were of comparatively little effect.

The Chairman of the Committee of Arrangements then announced various receptions and entertainments for the benefit of members and guests of the Congress. Among these was a reception by the President of the United States on Wednesday afternoon, a dinner at the Arlington in the evening, and a "smoker" by the Cosmos Club, Thursday evening.

The hour for the regular session of the Congress having arrived, the chairman announced as the subject of consideration,

THE GOUTY AND RHEUMATIC DIATHESES AND THEIR RELATION TO DISEASES OF THE EYE.

The first paper announced was that of DR. CHARLES STEDMAN BULL of New York. The title of the paper was

LESIONS IN THE RETINAL VESSELS, RETINA AND OPTIC NERVE, ASSOCIATED WITH GOUT. (See p. 578.)

DR. S. OLIN RICHEY of Washington followed with a paper, entitled

GOUT AND RHEUMATISM AS FACTORS IN THE ETIOLOGY OF GLAUCOMA.

The essayist premised the reading of his paper by a few remarks in support of the positions taken by the previous speaker.

He then said that the least confusing presentation of the subject is under its two extreme forms, acute inflammatory glaucoma and chronic simple glaucoma. All other varieties occur between these two, partaking more or less of one or the other, due to the same cause in different degrees of intensity; including secondary glaucoma, so-

called, which may be secondary to keratectasia, or fistula of the cornea, to iridocyclitis, or retinal hemorrhage, dependent upon gout; occlusion of the pupil, luxation of the lens, intra-ocular tumors, choroiditis, myopia—any of these, he said, may cause the increase of tension of a pseudoglaucoma, but not the intra-ocular tension of true glaucoma.

The essayist then presented the following propositions:

1. Increased intra-ocular tension in glaucoma is caused chiefly by distension of the blood-vessels internal to the sclerotic; rarely, and to slight degree, by derangement of intra-ocular secretion, or excretion.

2. Associated with increased intra-ocular tension is high general arterial tension, or arteriosclerosis, pulsation of the intra-ocular arteries and veins, with probable hypertrophy, but at least functional disturbance, of the heart.

3. As a result of persistent venous stasis, thrombosis and hyperplasia of connective tissue with substitution (substitutive fibrosis) takes place in all the tissues of the bulb.

4. In chronic glaucoma, the *materies peccans* of rheumatism cannot be excluded as a factor in causation. No reason appears for suspecting it of any agency in acute glaucoma.

5. Every form of glaucoma is owing primarily to gout (or goutiness) or to acquired syphilis in its tertiary stage.

6. Iridectomy, the first violence of the attack being past, so reduces intra-ocular pressure as to permit the *venæ vorticosæ* to be emptied, thus restoring the intra-ocular circulation and establishing normal tension. Any operation which lessens the surface pressure upon the vascular system within the eye, whatever the result, seems in reason open only to this explanation, for such vessels have no vasomotor system and no power of contraction, but dilate and contract in response to the greater or less force of the extra-ocular blood current.

The essayist then considered the various influences, physiologic and pathologic, which influence intra-ocular tension. He thought that the only rational explanation of the benefit which follows iridectomy in glaucoma is, that a happy moment is chosen when the first force of the storm is spent, and the operation, by easing the pressure upon the intrabulbar tissue and vessels, permits a removal of the venous stasis, and the active circulation to be restored.

Reasoning directly and by exclusion from unquestioned facts led the speaker to the conclusion that a condition always found in acute glaucoma which will account for all its features offers the true explanation of this form of disease. This he stated as follows: A great engorgement of the intra-ocular blood-vessels, overfilling the space within the sclerotic, most so posteriorly, about the entrance of the short ciliary arteries, and the two long ciliary arteries which pierce the sclerotic at a right angle, elongates the corpus vitreum in the direction of the length of the vessels by lateral pressure which is increased by the acute venous stasis and the advancing of the corpus vitreum, lens, and iris, by pressure from behind. This reduces the depth of the anterior chamber, and applies the iris to the cornea,

thus obstructing the anterior channels of filtration, and thus produces increase of intra-ocular tension.

The engorgement of the fundus oculi existing in acute glaucoma, always in direct ratio to the violence of the attack, shows it to be directly vascular in origin. A state of the system which leads to a reduction in the caliber of the peripheral arterial vessels, demanding an increased effort on the part of the heart, will account for this.

Whether the intra-ocular vascular engorgement is ever excited by the precipitation of sodium biurate within the eye or not, the author thought, would probably be settled by accidental observation. He did not believe it necessary to assume such a possibility.

Turning his attention to chronic simple glaucoma the essayist remarked that this differed so much from the other forms of the disease that some observers had been led to doubt whether it be glaucoma at all. He, however, considered it glaucoma, a chronic interstitial ophthalmitis. It is of slow development, preceded for years by a slowly increasing intra-ocular tension, with palpitation and uncertain action of the heart. Age is a predisposing factor only, as may be also a neoplasm found within the orbit. The important factors in the arthritic diathesis, the author believed, are an excess of uric acid and an excess of lactic acid—he holding the theory that this acid is the cause of rheumatism. He did not accept the belief of Haig that both gout and rheumatism are due to uric acid.

The essayist then considered at some length the similarities and dissimilarities between the gouty and rheumatic diatheses, with abundant references to the literature of the subject.

The next paper was read by DR. S. D. RISLEY of Philadelphia. Its title was

CATARACT AND ITS ASSOCIATION WITH THE GOUTY AND RHEUMATIC DIATHESES.

The essayist did not think it difficult to trace a distinct relationship between a large group of ocular affections and the lithic acid diathesis. In support of this, he referred to the frequency with which ocular manifestations, as well as the general health of persons suffering from eye symptoms, improve by a change to out-door life with attendant muscular exercise, deeper breathing, and increased excretion. He thought that not only the relationship of this diathesis to the milder forms of ocular trouble is overlooked, but that too often we fail to recognize the relation which exists between it and the more serious affections of the eye that occur especially during and after middle life.

The diseases of the heart and general vascular tree, the renal and hepatic complications, associated with and in some sense dependent upon impairment of the ultimate processes of nutrition, the high arterial tension, the hypertrophied left ventricle, the chronic nephritis, and contracted kidney, the rigid arterial walls becoming atheromatous, angina, apoplexies, present a picture of serious disease which we are too often called upon to treat.

It is not to be supposed that under these conditions the ocular blood-vessels can escape the disaster which has

fallen so heavily upon the general vascular system, or that the eye alone should escape the general impairment of the nutritive functions. We are rather prepared to expect the striking picture of disease so frequently presented, when we recall the fact that the choroid is a mesh of blood-vessels ramifying in a stroma of loose connective tissue. In the steadily advancing degeneration of the retinal blood-vessels in glaucoma, we see the arterio- and phlebo-sclerosis, the formation of yellowish-white spots of exudation in the region of the macula or between the macula and optic nerve, or possibly more widely distributed, or the innumerable small retinal apoplexies of hemorrhagic retinitis. In later stages of nephritis, or perivascularitis and hemorrhagic glaucoma, and also the choroidal disease which so often precedes cataract, these changes in the blood-vessels the essayist believed had in many cases been going on for years before the ocular defects became apparent. It is this fact he thought which made these ocular hemorrhages so ominous of cerebral apoplexy. The fact that these changes are usually found in or after middle life, had drawn too much attention to age as an etiologic factor.

Hard cataract has been regarded as a development of old age to the exclusion of other influences in its production. It should be borne in mind, he said, that while the lens loses its elasticity and becomes hard or even straw colored as age advances, it is only in exceptional instances that it loses its transparency to a degree which seriously impairs the acuity of vision. When therefore the lens undergoes not only this physiologic hardening but becomes also opaque it should suggest the presence of pathologic causes for this remarkable occurrence.

It is also true that opacity of the lens occurs in cases in which we can discover no evidence of the rheumatic or gouty diathesis either in themselves or their ancestors, yet even in these individuals the incipient cataract is so uniformly preceded by retino-choroidal disease and vitreous degeneration as to enforce the opinion that the opacity of the lens is a result of impaired nutrition caused by the associated affections of the uveal tract. The essayist adduced sixty successive cases from practice in more than half of which there had been a long period of asthenopia and "weak eyes" before the occurrence of cataract. In them he said there could be no doubt of the relation of cause and effect between the advancing opacity of the lens and the attending pathologic conditions of the uvea.

It is not surprising that the lens and vitreous body should undergo degenerative changes as a result of pathologic processes affecting its food-bearing membrane. The less vicious forms of uveal disease may also be influential in leading to impairment of nutrition of the lens and causing it to become opaque and that the gouty and rheumatic diatheses are among the most frequent causes of these chronic subacute forms of disease affecting the uvea. Careful study would reveal that the entire choroidal tract is more or less seriously involved in every case. It not infrequently happens that the recurrence of iritis is due to the lighting up of latent choroiditis under exacerbations of the rheumatic or gouty diathesis. All attacks do not pass to iritis, but each attack affects more and more pro-

foundly the nutrition of the eyeball. Such attacks are often attended by transient increase of tension, a steamy cornea, and foggy, vitreous body. Examination with a lens resolves this want of transparency into fine granular deposits in the vitreous, which clear up as the attack subsides. Upon repeated exacerbations, fine web-like opacities form, which float more freely as the vitreous degenerates and loses its normal consistency. The nucleus of the lens becomes more and more plainly outlined and the lens substance more reflecting. In many cases banks of opacity form in the periphery, from which spicules of opacity sooner or later project along the capsule toward the pole.

The essayist then reported at some length the history of a case which he had had under observation for a number of years, and in which the conditions were as he had described in the above report. In conclusion, he adduced a number of other considerations which confirmed his belief that the changes in the lens, choroid, and retina may be brought about by the rheumatic or gouty diathesis.

The next paper was by Dr. ROBERT SATTLER of Cincinnati upon

GOUTY AND RHEUMATIC AFFECTIONS OF THE UVEAL TRACT.

He called attention to the fact that in the history of gout mention is early made to the affections of the eye, especially of iritis (ophthalmia arthritica). Much later other parts of the uveal tract were also recognized as the seats of gouty and rheumatic affections, the ocular lesions either arising primarily from this part or appearing secondarily, and associated with similar lesions in other parts of the eye. He then referred to the positive knowledge we possess in regard to the clinical manifestations of gout and rheumatism, although their etiology and pathology remain somewhat obscure. The remainder of his paper may then be briefly summarized as follows:

1. Can gout or rheumatism be considered the principal etiologic factors in those cases of iritis and irido-choroiditis in which a searching examination fails to disclose that the disturbances of the joints are dependent upon syphilis, gonorrhea, chronic lead intoxication, malaria, anemia, and other actual or alleged constitutional causes?

This, the speaker said, is generally admitted, although with varying stress.

2. As to the relative frequency of gout, and rheumatism producing ocular lesions, the major share is assigned by Hutchinson to gout, while the liability to iritis is held to decrease in proportion to the prominence of purely rheumatic symptoms.

The essayist stated that it had been his experience to meet with a rather large number of cases of iritis which must be classed as rheumatic affections.

3. At what period are iritic and other affections of the uveal tract apt to occur? Are they more common during the acute outbreaks of local gout or rheumatism, or during the latent periods of these affections?

In answer to this question, the speaker thought that, as a rule, ocular complications appear during the early

manifestations of the uric acid diathesis, or during the stage which precedes for a longer or shorter period acute outbreaks of either gout or rheumatism, or during the intervals of acute or subacute recurrent attacks. He could find no evidence on record to show that they ever occurred during the acute attacks. If such were observed, he would regard it as nothing more than a mere coincidence.

4. Do the ocular disturbances, and particularly the lesions of the uveal tract, offer confirmatory evidence for any one of the many theories advanced to explain the morbid changes which affect the joints, tendons, and fibrous tissues in gout and rheumatism?

It was answered, that there was nothing distinctive which would enable us to recognize without fail, the iritis or irido-choroiditis of gout or rheumatism.

5. For clinical purposes, we may speak of three stages in the process of gout and rheumatism: (a) During the stage before local gouty or rheumatic invasions of the joints occur, we can hardly speak of gout or rheumatism as such, but must look upon these manifestations as goutiness, or a rheumatic or rheumatoid tendency. (b) After the malady declares itself, it may happen that its characteristics may be preserved for a long time, or even become permanent. (c) As either disease progresses or develops, it may partake more or less of the characteristics of the other until such an intimate blending takes place that by common consent it is termed "rheumatic gout."

In the stage of goutiness and of early gout, we meet with the typical "hot eye" appearance of the English ophthalmologists, but rarely with primary or isolated gouty iritis. The most frequent, and at the same time most treacherous, lesion, however, is an insidious variety of exudative choroiditis which often, in spite of the most rational medical treatment and more conservative surgical measures, necessitates enucleation.

An interesting case was then reported in which an iritis was treated on the theories above stated with success.

The speaker said that we not infrequently meet with lesions of the uveal tract, in which a distinct history is obtained which conclusively suggests either a rheumatic tendency without disturbance of the joints or one in which several undoubted paroxysms had preceded the ocular disturbance. Although the designation "rheumatic" is vague, there being no pathology on which to base it, it is supported by a mass of clinical facts.

The most frequent inflammatory affection due to this cause is iritis, either the acute plastic or the chronic variety. It may be the expression of a general irido-choroiditis or the results of an acute process, beginning and confining itself to the iris or the anterior portion of the uveal tract. It can be held that in the group of rheumatic gout, which is a blending of gout and rheumatism, lesions of the uveal tract and iritis in particular may occur. The speaker's own observations had familiarized him with a number of typical cases conclusively setting forth iritis as one of its common complications. Cyclitis and choroiditis are not so common.

If iritic and other complications occur in persons with

acute or chronic joint affections in whom syphilis, gonorrhea, chronic lead poison, and other recognized causes are found, are they more apt to occur if such persons are gouty or rheumatic?

This, the speaker considered an interesting point to determine. Mr. Hutchinson has answered the question for us. It demands and awaits further corroboration. In the only case of gonorrheal rheumatism with iritis which had come under the observation of the speaker, a gouty history was obtained.

Concerning other causes, the experience of the essayist had been too limited to justify him in expressing a definite conclusion, but he inclined to the opinion that a gouty or rheumatic heredity is of considerable importance in exciting or increasing the tendency to iritis or other complications.

RHEUMATIC AND GOUTY AFFECTIONS INVOLVING THE CORNEA, CONJUNCTIVA, AND SCLERA

was the title of a paper read by DR. R. A. REEVES OF Toronto.

He mentioned the difficulty of proving a rheumatic or gouty affection of the eye, and that, although chronic rheumatism is regarded as a cause of many eye affections, it is only in a certain proportion of cases an affection of the uvea. Yet the *materies morbi* of gout is often present in the system. Along with over-indulgence of appetite and profound worry and care, the relation of the diathesis cannot be ignored. The ophthalmoscope may show the presence of retinitis and choroiditis, and the diagnosis is made at a glance.

So many surface lesions of the eye are now attributed to a micrococcic origin that the essayist feared this factor in etiology might be carried too far, and recommended that the blood and other fluids be more carefully scrutinized.

In corneal affections with these diatheses, we usually find a wide-spread obscuration, resembling in appearance a glass that has been breathed upon. Desquamation of the surface epithelium occurs only exceptionally. An interstitial variety has also been described. This is especially toxemic in character and allied to syphilis. The affections which lead to uveitis may also lead to parenchymatous choroiditis without tendency to suppuration. The iris is exceptionally involved. The process may be associated with indelible sclerosed patches. The treatment consists of hot poultices and local injections of pilocarpin and eserine. De Wecker recommends iridectomy. This would appear to be allied to the catarrhal ophthalmia of which we hear but little at the present time, but which Mackenzie insisted upon a few years ago.

Centripetal corneal ulceration is likely to occur. Band-like opacities of the cornea always give rise to a suspicion of gout. The essayist then reported three cases of ephemeral conjunctivitis in subjects with gonorrhea which appeared to be due to a pseudo, or actually acute rheumatic tendency. Sir Dice Duckworth says that rheumatic and gouty deposits occur in the conjunctiva of the lids.

There is an interesting variety of episcleritis denomi-

nated by Fuchs, *episcleritis fugax*, the "hot eye" of Jonathan Hutchinson, more frequent in men than in women, attended by photophobia, lachrymation, and pain, the attacks lasting from one to eight days. The treatment consists of the topical application of pilocarpin. Episcleritis proper is distinguished by several authors as a circumscribed inflammation of the anterior part of the sclera producing later a widely spreading swelling two to five lines in diameter, one to two lines from the corneal margin, never attended by ulceration, but undergoing absorption in the course of weeks or months. It seldom occurs singly, one nodule usually appearing as another disappears. At times there is marked pain and irritability of the eye. It occurs especially in adults, some of whom are subjects of gout, and some of rheumatism. The treatment is the administration of salicylate of soda and the subconjunctival injection of pilocarpin.

Scleritis attacks any part of the globe, is not nodular, and is essentially chronic and recurrent. It is, as a rule, very painful, leaving a dusky, or slate-colored zone. The speaker urged recourse to pilocarpin in the treatment.

The malignant form of uveoscleritis, with staphylococcal swelling and ultimate loss of the eye, is not included, being connected directly with the scrofulous or strumous diathesis, and not with gout, or rheumatism.

DR. J. M. DA COSTA of Philadelphia stated that he thought it well to bear in mind the real nature of the diseases under discussion. In regard to rheumatism, the typical phenomena of swollen joints, acid perspiration, and tendency to heart affections, leave no doubt as to the character of the affection. But in so-called chronic or rheumatic gouty affections there is always doubt, and four-fifths of all cases called chronic rheumatism are not rheumatism at all. We should therefore carefully scrutinize all affections of the eye of the character ascribable to chronic rheumatism. He had no doubt that these would, in the future, be so reduced that there will be very little left of them.

We know more of the pathology of gout than we do of rheumatism. Whether as cause or effect, connected with faulty secretion or faulty excretion, a morbid state occurs in which uric acid is concerned. He doubted the existence of such a disease as rheumatic gout. There is such a disease as rheumatoid arthritis, in which the joints swell and uric acid is not found in the urine. It is not connected with gout or rheumatism. It is of great importance that we learn to associate or disassociate certain eye affections with this disease, and not with gout or rheumatism.

In general practice he had, in acute rheumatism, met affections of the eye, usually inflammatory in nature, ophthalmia, conjunctivitis, and the like. The most common had been conjunctivitis, and sometimes iritis, occurring during the attack of acute rheumatism, sometimes associated with the acute endo- or pericarditis. But gouty inflammation of the eye occurs not only in acute outbreaks of gout, but very frequently when no acute outbreak exists. It is very common to have this affection originate in one eye and then pass to the other. During a long experience, he could scarcely remember an affection

of the eye connected with a pure rheumatoid arthritis. Nor do endocarditis and pericarditis occur in this connection.

A certain number of persons have what is called suppressed gout, or, better termed, lithemia. In this, inflammatory affections of the eye are very common. These affections also commonly begin in one eye and pass to the other; sometimes associated with marked attacks of headache. The key to gouty cases is furnished in the careful examination of the urine. In conclusion, the speaker reported the case of a prominent gentleman who suffered from repeated attacks of eye trouble with headache, in whom careful regulation of the diet, with the administration of lithia water and colchicum had resulted in a period of freedom from all symptoms for the last two years. There was no evidence of gout in the case, unless a slight tendency to asthma, but the result of treatment had been sufficient to warrant the conclusion that the eye trouble was due to that diathesis.

A session was now held under the auspices of the American Otolological Association.

A paper was read by DR. CLARENCE J. BLAKE of Boston on

THE RELATION OF OTOTOLOGY TO GENERAL MEDICINE.

The author remarked that the gifts of otology to general medicine are nowhere more clearly shown than in the diseases of the ear occurring coincidentally with the exanthemata of childhood. He insisted upon the importance of early and repeated examinations of the ears of children suffering from the acute exanthemata. Attention was also given to the occurrence of ear complications in diseases of the pleural cavity in childhood.

The importance of testing the hearing of school children should interest and influence the profession at large. The generally received opinion that diminution of hearing in children in consequence of disease is rare, is a mistake. Very nearly 25 per cent. of the patients attending our aural clinics are children under fourteen years of age; of this number 50 per cent. suffer from suppurative inflammation of the middle ear, and of this number 10 per cent. or more owe their origin to the exanthemata, while throughout the United States 27 per cent. of deaf mutes have suffered from suppurative middle ear disease in early childhood.

The surgery of the ear requires a wider range of skill than general surgery. We have not only to attempt to save life, but also to conserve, so far as possible, the hearing power and leave undisturbed the equilibrating function of the ear, and also to avoid injuring important structures closely contiguous to the operative field.

The so-called chronic catarrhal inflammation of the middle ear is one of the most frequent diseases of the ear which come under the consideration of the general practitioner, making in the temperate zone about thirty per cent. of all the material ultimately referred to the aural specialist. Another example is chronic non-suppurative middle ear disease, in which the deleterious changes in the lining membrane of the tympanic cavity are furthered by general nervous over-strain.

One of the most striking examples of the elucidative work of otology is that which relates to the definition and explanation of the curious complex of symptoms of which vertigo is the most marked manifestation. It is now a recognized fact that an effusion or hemorrhage in the labyrinth may affect the hearing or the balancing power or both. Another subject which should command the attention of the aurist and general practitioner is the "fatigue of deafness," a common and often underestimated factor in the causation and persistence of neurasthenia.

In conclusion the speaker urged the importance of a more thorough teaching of otology in our colleges. The inducement which led the student thirty years ago to take up the study of otology, was because it presented a promising domain for original research, and this is as true to-day as it was then.

(Continued on page 608.)

AMERICAN SURGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held at Washington, D. C.,

May 4, 5, and 6, 1897.

FIRST DAY—MAY 4.

The President, DR. JOHN COLLINS WARREN of Boston, delivered an address upon

THE INFLUENCE OF ANESTHESIA ON THE SURGERY OF THE NINETEENTH CENTURY.

The records of ancient history show that physicians and surgeons had in mind the possibility of an agent being discovered, the use of which might prevent pain in surgical operations. Although it has been said that the discovery of surgical anesthesia was a surprise, that its advent was marked by no tentative steps, that it appeared to have had no preliminary experimental stage, yet a retrospective glance at the history of the previous half century will show that the idea was working in men's minds more powerfully than before, and that, as Paget says, a great truth lay unobserved, though it was covered by so thin a veil that a careful physiologic research must have discovered it.

The well-known observations of Davy upon nitrous oxid and Faraday upon the vapor of ether are among the earlier of the reliable records; while of those which immediately led to the introduction of anesthesia into surgical practice the experiments of Colton and Wells with the former and of Long, Morton, and Jackson with the latter stand preeminent. The work of the several Americans who were most active in the application of the discovery began to attract public attention in 1844 to 1846, and it was upon the 16th of October of the latter year that Dr. John C. Warren successfully performed the first surgical operation under anesthesia in the Massachusetts General Hospital, Dr. W. T. G. Morton administering ether. On December 21st, Liston, in London, amputated a thigh and performed an evulsion of the toe nail with perfectly satisfactory results.

Thus the great step was taken, the "thin" veil was suddenly thrown aside, and what had been before a surmise of the scientist, a pastime of the idle student, and

the dream of the surgeon, suddenly assumed practical form and shape and became a living truth, revealed in all the fulness of perfection.

The effect upon the practice of surgery was immediate and revolutionary, both in extending its domain and increasing its activity. The record-books of the Massachusetts General Hospital show the total number of operations during the five years following the introduction of ether was over two and one-half times as great as that in the five preceding years.

The question whether anesthetics increased mortality or not was one which was much discussed formerly. Simpson believed that they did not. Arnott brought forward figures to show that the mortality had been increased 12 per cent. in amputation and 28 per cent. in lithotomy. Erichsen also believed the mortality-rate had increased since the use of anesthetics in operative surgery. Curling gives the mortality of amputations of thigh and leg in the London hospitals for 1837 to 1843 at 41 per cent. During 1847, in 73 cases in which an anesthetic was given, the mortality was 19 per cent. At the Pennsylvania Hospital the mortality of amputation from 1835 to 1840 was 36 per cent.; from 1840 to 1845 it was 20 per cent.; from 1850 to 1855 it was 23 per cent., and from 1855 to 1860 it was 31 per cent. At the Massachusetts General Hospital the death-rate was, as a rule, decreased in the different classes of operations. The rapidity with which certain operations were performed undoubtedly favored asepsis, particularly in all aseptic cases, and probably in any operation which could be done quickly and thoroughly. In many cases of spreading sepsis rapidity was a bar to thoroughness, and results were correspondingly unsatisfactory.

When we reflect how few of the aids to surgical diagnosis were possessed by surgeons in 1846, the amount of work which they accomplished presents all the stronger contrast. They had no endoscope, no ophthalmoscope, no modern aspirating-needle, no clinical thermometer, and no laryngoscope. The stethoscopes were far from perfect. Examination of the blood and quantitative analysis of the excretions were unknown. The microscope was just coming into use for pathologic purposes. They possessed, however, an excellent technic so far as operative surgery was concerned. Their capacity for operating was unlimited, but their judgment was not guided by the many aids which serve us to-day.

It is interesting to note, however, the strangely appropriate order in which the great facts of medicine and surgery were given to the world in this progressive century. Hunter had already roused the thirst for knowledge which led others to rush forward and immortalize themselves as pioneers in anatomy, like Bichat, or in modern surgery, like Cooper. Then came the work of the pathologists, such as Cruveilhier, and the host of German pioneers. Just as the surgeon had brought his operative technic to a high degree of perfection, and science had made a practical instrument of the microscope, and preparation had been made for another advance all along the line, then came anesthesia, which widened the field of research sufficiently to occupy the world busily for another quarter of

a century. It gave to surgery a more powerful impetus than it did to experimental medicine. At a moment when surgery seemed rushing wildly onward to its own destruction, with science lagging far behind, Lister came to the rescue, and scientific equilibrium was again restored.

"Gentlemen, the Old Massachusetts General Hospital stands as it did in 1846, with its slightly Bulfinch dome and granite columns. From a scientific standpoint it seems an antiquated structure in comparison with the modern pavilion wards, laboratories and operating-theaters which surround it, but it will never be torn down. It will always remain as one of the conspicuous landmarks of this wonderful century—as a shrine of surgery sacred to that moment 'when the fiercest extremity of suffering was steeped in the waters of forgetfulness and the deepest furrow in the knotted brow of agony was smoothed away forever.'"

DR. JOHN HOMANS of Boston read a paper, entitled

THE INDICATIONS FOR AND THE TECHNIC OF HYSTERECTOMY.

The author considered that the uterus should be removed for intractable hemorrhage and for malignant disease, as well as in many cases of uncontrollable prolapse, incurable chronic inversions, cases of infection, and to cure puerperal sepsis. He dwelt at some length upon the technic of hysterectomy, vaginal and abdominal, and a combination of the two methods, described various special manipulations, dwelt upon the importance of the preparation of the patient, and referred to the question of using a Jacques' self-retaining catheter in the bladder after these operations.

DR. H. H. MUDD of St. Louis in discussing this paper said that hysterectomy for fibroid tumors had a technic which was not uniform and which varied with the special indications. He expressed himself as especially gratified to hear that Dr. Homans discards the clamp. In his opinion, hysterectomy for suppurative periuterine inflammations should be strictly limited to a very narrow field. Vaginal hysterectomy for malignant disease is efficient and desirable for those cases where the disease is limited to the external os. The extension of carcinoma of the os is by infiltration of new tissue in two directions; first, along the vaginal tissue, and, second, into the broad ligaments. Most of the cases in which malignant growth begins in the body of the uterus should be subjected to abdominal hysterectomy, as this is certainly the only method of operation where the uterus is secondarily involved. The greater number of cases of malignant disease which require hysterectomy have their origin in the os, and if presented early to the operator may be removed by the vaginal route. The preparation of the patient for these operations is in accordance with the general rule, but the author's preference is to have the patient anesthetized upon the operating table in order that the time necessary for the anesthetic may be as short as possible. The Trendelenburg position is preferable, and the abdominal incision should be free enough to give room for rapid and accurate work. If the growth is soft and pliable, it should

be cleansed with a curette, washed with sterile water, wiped with a gauze sponge and the firmer margins approximated by sutures.

After describing at some length the various steps of the operation, the question of the ligature was taken up, and silk was advised to be used in securing the ovarian artery. It may be cut short, or left with one end resting in the vagina. Hemorrhages should be well controlled by ligatures, or by clamps. The author has discarded iodoform gauze in all cases where it comes in contact with the peritoneum, as he considers it a dangerous agent.

DR. F. E. LANGE of New York stated that in his opinion the principal dangers in these cases were hemorrhage and sepsis, and he thought it a good idea to lay down certain general rules to be followed in approaching all these cases. All working in the dark should be avoided. The speaker had occasionally employed a crucial incision in these cases, and in some had made an incision above the symphysis pubis, but found that in some of the crucial operations the fleshy portions do not offer enough resistance, and this is especially true where the patients have not been pregnant before the operation and become so afterward. In some cases such an extensive raw surface has remained after operating that it has been necessary to use the large omentum in order to prevent the agglutination of the intestines. The paravaginal, or pararectal incision has also been employed to good advantage, which consists of the separation of all of the soft parts along the side of the rectum. The hemorrhage is considerable in these cases, and it is well to secure the vessels as much as possible before they are cut. The advantage of this incision is that the floor of the pelvis becomes much more accessible. Provision against infection is also greater because the drainage away from the peritoneal cavity takes place.

DR. DUDLEY P. ALLEN referred to an operation in which the patient is placed in the Trendelenburg position, the fibroid is drawn over the pubis, and is separated from the surrounding structures with a pair of scissors. The uterus is divided from the bladder anteriorly by a few cuts of the scissors, and the broad ligament is held between the thumb and finger. This operation, up to the present time, has been very successful.

DR. ALBERT VANDERVEER of Albany said he agreed with Dr. Homans that when curetting and all intelligent lines of practice had been carried out without recovery for the correction of misplacement, removal of the uterus is the proper procedure. As to the method of removal, he declared himself firm in the conviction that if the vagina is normal, or comparatively so; if the cervix, particularly the external os, is in a healthy condition, the abdominal or supravaginal hysterectomy gives the patient a degree of normal vaginal anatomic relations that is comforting and beneficial to her, in addition to giving the operator an opportunity to examine the pelvis from above, to relieve adhesions, to bring under positive observation the tubes and ovaries, and, if not healthy, to remove them. On the other hand, if there be present decided cystocele, or rectocele, or prolapse of one or both ovaries, then the

vaginal route is to be preferred. In his opinion, the clamp should be avoided in the abdominal operation.

He regretted very much the fact that these cases are not brought to the attention of the surgeon before the disease is so far advanced, and referred to the various diseases to which the condition is ascribed, as, for example, supposed change of life or ill-health from the last confinement or miscarriage. Speaking of carcinoma, he considered an operation was called for when it was confined to the uterus, and all suspected symptoms and indications had been confirmed by microscopic examination of specimen removed. When the uterus is not too large from invasion of the body by the disease, when there is no considerable fibrosis present, and when no pregnancy beyond the third month complicates, the surgical route should be vaginal. The presence of a fibroid does not necessarily mean an operation, as many patients suffer so little inconvenience that such a procedure is not called for, and curetting will answer in a few cases. As to the combined operation, panhysterectomy, the author considered that but few cases called for this procedure, but when it is done, surgeons should give themselves the benefit of a free abdominal incision. He objected strongly to taking away any more of the pelvic organs than was absolutely necessary if like good results could be secured by a less severe procedure. In his opinion, it was inadvisable to place a Jacques' self-retaining catheter in the bladder after these operations.

DR. J. WILLIAM WHITE of Philadelphia read a paper, entitled

THE X-RAYS IN SURGERY.

He divided the consideration of the subject (1) in its relation to foreign bodies, (2) fractures and luxations, and (3) diseases of bones and joints. He stated that foreign bodies in the cavities of the body could be located by a system of triangulation by means of successive skiagraphs having known relations to one another and to a fixed point on the surface of the body next the plate. Bullets in the cranial cavity have been located and removed, and their recognition is easy in the majority of cases, while in the thoracic cavity they can be located with reasonable accuracy in the trachea, bronchi, lungs, or pleura. Rubber drainage-tubes in the pleural cavity cannot invariably be detected by the Röntgen method, as they seem to be more or less translucent to the rays. Detection of bodies in the esophagus continues to be very satisfactory, and the conditions of foreign bodies in the abdominal cavity are about the same as in the thorax. Bodies in the pelvic cavity can be found by taking skiagraphs with the patient in various positions. With regard to fractures of the skull, it is especially desirable that we should be able to recognize (a) fracture of the inner table, (b) linear fracture, and (c) fracture of the base. Up to the present time there is no case on record of the first two having been done clinically, but it has been accomplished experimentally with entire success. Skiagraphy will doubtless result very beneficially in the future in the prognosis and treatment of fractures and dislocations of the spine, and will no doubt give us great help in obscure cases of fracture of the sternum, scapula, clavicle, and pelvic bones.

On account of the movements during respiration, skiagraphing the ribs is especially difficult, but this movement can be much restricted by a fixed dressing not opaque to the rays. Fracture and luxation of the bones of the extremities can usually be readily demonstrated. Ununited fracture, even in the presence of close fibrous union, can be shown with great accuracy. In disability following old fractures near a joint, skiagraphy has been of the greatest help in determining the mechanical cause of the limitation of motion. Referring to the medico-legal aspect of this matter, and to the question of whether or not the patient has a right to demand as ordinary care that the medical attendant should have a skiagraph of the fracture taken, the author stated that at the present time he would unhesitatingly answer in the negative. There can be no doubt, however, that skiagraphs will figure largely in suits for damages in the near future. There is no doubt that a definite diagnosis will soon be possible in cases of disease of the bones and joints, and it is evident that skiagraphy has added to the precision of our management of many forms of these diseases. In various forms of cardiac disease, the fluoroscope is likely to be more useful than the skiagraph, as, in the case of organs in motion, the skiagraph can only give the net result during the period of exposure. Referring to the amount of exposure necessary, the author stated that this varies very much, and in the case of stone in the gall-bladder, the thickness of the abdominal walls and the depth of the calculi from the surface played an important part. Renal calculi had been found and successful operations performed based on the skiagraphic evidence, while vesical calculi are more difficult to find on account of the over-lying position of the symphysis pubis. Urethral stone has not yet been seen clinically but seems likely to be easy of recognition. As to the possible therapeutic properties of the rays, they were first thought to be germicidal, but this has since been denied. The author stated that he had directed his attention to the cure of cancer with the rays, and his hopes of success had been somewhat bolstered up by his experience, although as yet he had no results to report. In the meantime he felt confident that no harm could come to the patient, even though the experiment should be unsuccessful.

DISCUSSION.

DR. W. W. KEEN of Philadelphia, in discussing this paper, called attention to the importance of the medico-legal relations of the X-rays, and mentioned a case showing the unreliability of skiagraphs as a means of diagnosis.

DR. CHARLES B. NANCREDE of Ann Arbor dwelt upon the importance of taking skiagraphs in various positions, and quoted cases in support of his statement that one or even two or three pictures should not be used as a basis of diagnosis. He also stated that the fluoroscope will occasionally be successful where the skiagraph has failed, and *vice versa*. He illustrated his remarks with several skiagraphs, and mentioned that an apparatus costing but \$50 would throw a spark $7\frac{1}{4}$ inches and do all that was necessary in the majority of cases.

DR. G. R. FOWLER of Brooklyn dwelt upon the im-

portance of taking a picture in various positions, and mentioned a case in which he was able to demonstrate in a perfectly sound limb an apparent deformity similar to that which existed in a previously injured limb. He also stated that the fluoroscope was often of use when the skiagraphs gave negative results, and laid great stress upon the possibility of defective skiagraphic plates.

DR. M. H. RICHARDSON of Boston showed a number of skiagraphs and emphasized the medico-legal relations of the X-rays. He stated that a number of judges had signified their attention of admitting these pictures as evidence in suits of malpractice.

DR. WILLIAMS showed a number of skiagraphs, and also demonstrated an instrument for showing calculi in the bladder.

DR. CHRISTIAN FENGER of Chicago referred to a case in which search was made for a bullet in the cranium, and in which the soft parts of the skull down to the bone subsequently died, presumably due to too long exposure.

(Continued on page 611.)

ASSOCIATION OF AMERICAN PHYSICIANS.

Twelfth Annual Meeting, Held at Washington, D. C., May 4, 5, and 6, 1897.

FIRST DAY—MAY 4TH.

The Association met at 10 o'clock, A.M.

The President, DR. J. M. DA COSTA of Philadelphia, in the Chair.

PRESIDENT'S ADDRESS.

The President read his annual address, entitled "Tendencies in Medicine," which will appear in the next issue of the NEWS.

MISCELLANEOUS BUSINESS.

The Council recommended the adoption of the amendment proposed last increasing the membership of the Association from 100 to 125. After discussion this amendment was adopted. Dr. S. C. Busey, Washington, said that he had been requested by the medical staff of the navy to ask that the Association should present resolutions to Congress praying it to enact a law giving the medical staff of the navy a distinct rank, instead of the relative rank now conferred. On motion of Dr. Sternberg, surgeon-general of the army, this was referred to the Council for report.

THE SERUM TEST FOR TYPHOID FEVER.

By DR. GEORGE B. SHATTUCK of Boston. He dealt with the cases of typhoid fever occurring in the Boston City Hospital which were tested with Widal's serum. All the tests were made with liquid blood. In the laboratory a longer maximum limit, one hour, was allowed for the reaction than some observers would consider justifiable, though many of the reactions did occur in much less time. The character of the reaction was considered as well as the time within which it occurred. The room culture reacted less promptly than the thermostat culture. Three of the cultures were from the spleens of deceased patients, and one from fluid aspirated from an enlargement, corresponding in position to the gall-bladder, in a

patient who was suffering from that disease. Tests made with room cultures had proved so satisfactory that all tests were now made in that way. In these tests the organisms were fewer in number but were larger and more motile, and the reactions, while perhaps a little slower, were so absolute that little difficulty was experienced in making a diagnosis. In the thermostat cultures there was often a small sediment of dead organisms, which if shaken up into the fluid might interfere with the diagnosis. Room cultures could be used for the test when much older than thermostat cultures, the growth being more gradual and the organisms harder.

An analysis of 116 cases, with a clinical diagnosis of typhoid fever, showed the reaction as follows:

On the 6th day in 1 case.			
"	"	7th	" " 4 cases.
"	"	8th	" " 6 "
"	"	9th	" " 5 "
Between the 10th and 15th day 23 cases.			
"	"	15th	" 20th " 16 "
"	"	20th	" 30th " 32 "
"	"	30th	" 40th " 13 "
"	"	40th	" 50th " 11 "
"	"	50th	" 60th " 5 "
"	"	60th	" 70th " 2 "
"	"	70th	" 80th " 2 "
"	"	80th	" 90th " 0 "
"	"	90th	" 100th " 0 "

In one case there was a reaction on the 199th day, one on the 110th, one on the 121st, and one on the 122d day. In one case there was no reaction on the 26th day, but it was present on the 27th day; in one case no reaction on the 15th, present on the 16th; in one case no reaction on the 16th or 18th days, present on the 59th day; one case no reaction on 7th day, present on the 9th day; one case no reaction on the 18th day, present on the 45th day.

In five of the cases the serum test gave a positive result, and was of material service in determining a doubtful diagnosis. In one case physical examination was negative; characteristic symptoms were absent, but there was some temperature. There had been cases of typhoid fever in the neighborhood of the patient's home. The serum test gave a good reaction on the twenty-second, twenty-third, and twenty-fourth days. Six weeks before admission to the hospital, the second case recorded suddenly became mentally confused for a short time without losing consciousness. He recovered, but had a similar attack, from which he recovered more slowly and less completely. He was slow in expression and mislaid words. The left leg was swollen and painful on pressure. Blood, albumin, and casts were found in the urine. The attending physician, a practitioner of large experience in typhoid fever, diagnosed serious renal disease, and gave a grave prognosis. On examination in hospital the edge of spleen was felt; otherwise physical examination was negative. Temperature might have been that of the end of typhoid. No diazo reaction. Serum test gave a prompt reaction, and patient made a good recovery.

In eighteen cases with clinical diagnosis other than

typhoid fever there was no reaction in fifteen, of which one was phthisis, two pneumonia, two pleurisy, four meningitis, three "febricula," one acute miliary tuberculosis, one appendicitis, one influenza. There was a reaction in three cases—one of pneumonia, one acute miliary tuberculosis, one exophthalmic goiter. In all three of these cases the typhoid reaction was justified, and the test made the diagnosis.

The query having arisen whether the serum from the blood of the negro was more prone than that from the white to produce the reaction, even in the absence of typhoid fever, tests were made on thirteen colored patients with clinical diagnoses other than typhoid. In eight there was no reaction. In three there were reactions more or less satisfactory with thermostat cultures, but none with room cultures. In two there were good reactions. One was a black negress, the other a mulatto born in Africa. They certainly had not had typhoid since entering the hospital, but typhoid could not be excluded from the histories for the previous six months.

The diazo reaction was sought for in 89 of the 125 cases of typhoid fever, and was found in 42 cases and absent in 47 cases. In one case, curiously enough, the diazo reaction was present on the fifteenth day when the serum test was absent, and absent on the fifty-ninth day when the serum test was present.

DISCUSSION.

DR. A. C. ABBOTT of Philadelphia said that his experience with the Widal test had been made in municipal practice in Philadelphia, where the conditions were not so satisfactory as in Dr. Shattuck's experience. His, however, corresponded very closely with those obtained at the Boston City Hospital. Out of 68 cases in which a clinical diagnosis of typhoid had been made, the serum test responded in 66.

DR. J. H. MUSSER of Philadelphia reported a case which had been brought into the wards of the hospital with no evidence of typhoid fever, but was suffering from marked cerebral symptoms. The serum test was applied, and the reaction was present in a marked degree. Several days afterward meningitis set in and the patient died. In this case the reaction was present all the time, and was the only evidence that the patient was suffering from typhoid.

DR. WILLIAM OSLER of Baltimore gave an abstract of the experience with Widal's test at the Johns Hopkins Hospital. In forty-four cases the reaction was perfectly satisfactory, and had been found several times very late in the disease. Several cases had been admitted that had suffered primary attacks outside of the hospital, in which a reaction to Widal's test was found. In one case of meningitis the absence of the serum reaction determined the diagnosis.

DR. W. B. ATKINSON of Philadelphia said he would like to know how long the susceptibility of the blood to the Widal reaction would persist. Persons might have had typhoid fever at some previous time, and in a subsequent illness a blood examination would give the serum test.

DR. JAMES TYSON of Philadelphia said that two observations in the use of Widal's test had been made by him which might be of interest. One was a young boy admitted on the seventeenth day of an attack of so-called typhoid fever, having been under the care of a well-trained physician outside the hospital up to that time. He had a temperature ranging from 101° to $103\frac{1}{4}^{\circ}$ F., and many symptoms of typhoid. There was no reaction to the serum test, but the diagnosis of typhoid was not changed. He declined rapidly, and the autopsy revealed miliary tuberculosis of the lungs, but no lesions of typhoid fever except enlarged spleen. Another case was that of two sisters, who, after skating on the Schuylkill, had drunk from a hole in the ice. Two days afterward both were taken sick, and both had decided fever and headache, and one had had two attacks of epistaxis. The other had two spots on the abdomen which behaved very much like those of typhoid fever. Two specimens of the blood of the older were examined, the first showing positive, but somewhat slow reaction. An examination of the blood of the younger, sent at the same time, gave a very incomplete reaction. At no time did either have diarrhea. The older never had any spots, while the younger, whose case aborted, and in whom the serum test gave only an incomplete reaction, had only two.

DR. BILLINGS of Chicago said that he had had considerable experience with the use of Widal's test. Failure in its use was often due to the fact that the instructions given by Widal and Johnson were not carried out. The instructions given by the latter were that old culture should be used—that the old culture should be used as a basis, and the new culture made from that. Old cultures were rather easily killed by the blood serum in very many cases, such as septicemia and other surgical diseases. The test was more constantly positive in typhoid fever, and more constantly negative in other diseases.

DR. JAMES T. WHITTAKER of Cincinnati reported a case of the daughter of a physician who was listless, had fever, headache, and a temperature of 100° F. Albumin was found in the urine, and the father thought she had Bright's disease. He came to the conclusion that she had latent tuberculosis, and gave her an injection of tuberculin, but got no reaction. Later he applied Widal's test and got reaction. Had also applied the test in four other cases of ambulatory typhoid, or in protracted convalescence from typhoid, with positive results.

DR. F. C. SHATTUCK of Boston reported the case of a young girl who had been ill for some time with a fever of 104° F. and cerebral symptoms. Afterward the fever abated, but she did not get well, and he was asked to see her. He asked the attending physicians: "Why is this not a case of typhoid?" They said they did not think it was; that it was more like Bright's disease. He took a specimen of her dried blood and examined it by Widal's test and got the reaction. This corroborated the diagnosis in his own mind. The cases of typhoid, complicated with renal symptoms, are misleading, but the outlook is better than if these symptoms exist independently.

DR. JANEWAY said he wished to make a few remarks about the danger of Widal's test. The danger lay in de-

pending upon this test, implicitly, and in its absence, even though the clinical symptoms of typhoid were present, ruling out the diagnosis of typhoid.

GALL-BLADDER INFECTION IN TYPHOID FEVER

was the title of a paper by DR. A. LAWRENCE MASON of Boston.

The speaker said that the normal bile was sterile, but that when the system was weakened by disease the micro-organisms in the duodenum might enter the gall-bladder through the bile ducts. So, when the blood was teeming with micro-organisms they might reach the gall-bladder after a number of days. In a number of cases of typhoid fever complicated with gall-bladder infection, gall-stones had been found. The question arose whether typhoid fever was ever the cause of gall-stones. In nineteen cases recorded associated with gall-stones, they had their first attack of biliary colic after an attack of typhoid fever. As to the treatment, simply tapping the gall-bladder will generally suffice, as in his case, and only in rare cases should laparotomy be resorted to. His conclusions were that the gall-bladder was infected by micro-organisms from the intestines or blood; that gall-stones predispose to the complication; that typhoid fever may lead to the formation of gall-stones in predisposed cases.

HEPATIC COMPLICATIONS OF TYPHOID FEVER.

By DR. WILLIAM OSLER. The rarity of this complication was shown by the fact that in 2000 cases of typhoid fever there were only 5 with inflammatory processes in the liver. The symptoms of the disease and complication very much resemble the appearance of appendicitis. He reported a case of this kind which was operated upon for appendicitis, and when the abdomen was opened it was found that the appendix was normal, but there was inflammatory disease of the gall-bladder, which was very much enlarged. The gall-bladder was tapped, and 100 c.c. of clear fluid removed. The gall-bladder was then packed with gauze, and the patient recovered. Subsequently another operation was performed for the removal of a stone in the gall-bladder. The colon bacillus was present in this case.

DR. WILLIAM T. COUNCILMAN of Boston, in discussing the paper, said that he thought if a thorough examination could be made it would be found that the number of cases in which typhoid bacilli were found in the gall-bladder would be very much larger than was generally supposed. His impression was that they could nearly always be found in a case of typhoid fever. The manner of infection, he thought, was through the blood.

UREA ESTIMATIONS IN CASES OF TYPHOID FEVER TREATED BY THE BRAND BATH METHOD.

By DR. JAMES TYSON of Philadelphia. The paper gave the details of a case of typhoid fever in which the urine examination showed some albuminuria and hyaline casts. In spite of these symptoms the Brand method of treatment was persisted in, and it was found that so far from there being a suppression of urine during the baths the secretion was markedly increased. The albumin bulk remained at one-quarter bulk until fourth day, when

it fell to one fifth, and on the seventh day to one-twelfth. After that date it disappeared, and with it the casts. "This is the history of a case of typhoid fever strikingly complicated with conditions which superficial observation would expect to increase any risk to which the patient is subjected by cold bathing, *vis.*, nephritis and deep-seated bronchitis, possibly broncho-pneumonia. So far from aggravating either of these two conditions, both abated and early disappeared."

He said further that the effect of cold baths in exciting secretion of urine has long been recognized, and almost every person who is in the habit of taking a frequent cold bath has experienced such effect in his own person. The sources of urea in the urine in fever are two: (1) the nitrogen in the proteid food ingested; (2) the oxidation of tissue, which is much increased during the fever process. He concluded by saying: "At present my confidence in the hydratic treatment is such that I would not feel comfortable to treat a case in any other way unless such treatment were insisted upon by the patient."

CANCER OF THE STOMACH IN EARLY LIFE; AND THE VALUE OF CELLS IN EFFUSIONS IN THE DIAGNOSIS OF CANCER OF THE SEROUS MEMBRANES.

By DR. GEORGE DOCK of Ann Arbor, Mich. The report was of a case of cancer of the stomach (scirrhus) in a boy of nineteen years, with extensive infiltration of the stomach and early obstruction of the cardiac orifice. Metastasis in the peritoneum and pleura with fatty ascites had occurred, followed by effusion in the pleural cavities, first left, then right. In the various effusions were cells which, besides containing fatty granules and vacuoles, showed in a large proportion karyokinetic figures, both typical and atypical. After a reference to the literature, a comparison was made with the findings in other effusions in serous cavities, tending to give to such cells a certain diagnostic value.

DR. SIMON FLEXNER of Baltimore said that he had performed an autopsy on the body of a young person at the Johns Hopkins Hospital, in which there was a large tumor of the mesentery. The cells of this tumor were so remarkable that he called special attention to them, and it was said that a diagnosis of carcinoma might be made from these cells alone. He worked the case up further, and demonstrated that it was a case of primary tuberculosis of the peritoneal glands.

THE INFLAMMATION OF THE COLON.

By DR. FRANCIS DELAFIELD of New York.

Dr. Delafield read a brief abstract of an exhaustive paper with this title, illustrating it with an extensive series of very large and beautiful photomicrographs. He dealt simply with the forms of inflammation of the colon to be found in and near New York. He divided the disease into (1) A colitis without structural changes in the colon, of which the prognosis is good except in children, and which can be successfully treated in a variety of ways. (2) A colitis with purulent infiltration of the connective-tissue coat, which is regularly fatal, and for which there is no satisfactory treatment. (3) A colitis with exudation, productive of new tissue and necrosis, the inflammation

beginning in the glandular coat, which has a disposition to continue for a long time, is sometimes fatal, and is difficult to treat satisfactorily. (4) A colitis with exudation, the formation of false membranes and necrosis, of which the prognosis is serious, and for which the best treatment is the administration of large doses of ipecac and the irrigation of the rectum. (5) A colitis caused by the ameba coli, characterized by necrosis combined with a variety of inflammatory changes, and often associated with similar changes in the liver, of which the prognosis is serious, and for which the best treatment is the administration of large doses of ipecac and the irrigation of the rectum.

He said, as regards the treatment of these different forms of colitis, it seems to me that the first thing to determine is whether the inflammation is confined to the lower end of the colon, or extends higher up. The second thing to determine is whether the inflammation is or is not accompanied by necrosis of portions of the wall of the colon. If the inflammation is confined to the lower end of the colon it can be treated by irrigation alone. If it is confined to the upper two-thirds of the colon it can be treated by drugs alone. If it involves the whole length of the colon both drugs and irrigations are necessary. An irrigation for an adult should consist of as much as two quarts of fluid, and the fluid must run in and out freely. If the colitis is acute and without necrosis, the best fluid is an infusion of flaxseed. If it is a colitis with necrosis, solutions of corrosive sublimate, chlorid of zinc, and formalin have given me the best results. If the inflammation involves the upper part of the colon and is without necrosis, rest in bed, a milk diet, and the preparations of opium and of bismuth are usually all that are necessary. But if it is a colitis with necrosis, ipecac in large doses, castor-oil in small doses, nitrate of silver, salol, and naphthalin are the most useful drugs.

The remaining three papers were read by title.

(Continued on page 614.)

AMERICAN GYNECOLOGICAL SOCIETY.

Twenty Second Annual Meeting, Held at Washington, D. C., May 4, 5, and 6, 1897.

FIRST DAY—MAY 4TH.

The President, JAMES R. CHADWICK, M.D., in the Chair.

DR. A. F. A. KING of Washington read a brief address of welcome, which was happily worded and to the point.

DR. BACHE MCE. EMMETT of New York read a paper, entitled

MULTIPLE MYOMATA IN THE ABDOMINAL CAVITY.

The tumors referred to belong to that class of myomata known as leiomyomata or myoma levicellulare, those formed by unstriped muscular fiber. They generally spring from the uterus, but are occasionally found in other organs. It was formerly believed that these growths were caused by "irritation" or "inflammation," but this explanation is hardly sufficient. They develop most frequently in the uterus, as this organ is made up almost entirely of unstriped muscular tissue, and although

they are supposed to be permanent, they increase or diminish in size and take on many changes in structure. In the uterus, this is probably due to the contractility of the tissue, to pressure, or to some change in the blood supply; as, for example, when the menopause is established. Although they show little tendency to malignancy, they often degenerate into carcinoma or into spindle or round-celled sarcoma. The symptoms are usually those due to pressure on neighboring viscera.

The author reported an interesting case in which several of these tumors were found in the abdominal cavity of a woman twenty-eight years of age, each having a pedicle of omental tissue and no uterine attachment whatever. The patient was first operated upon in 1894, when a large mass, adherent to omentum and intestines, and attached to the fifth lumbar vertebra, was removed. The left ovary was found to be cystic and was also removed with the tube. On microscopic examination, the tumor proved to be a myofibroma, and the pathologist expressed the opinion that it had at one time been attached to the uterus. The author considered the growth retroperitoneal, as it had raised up the peritoneum and ureter. During the removal of the tumor, the ureter was accidentally severed, and a ureteral anastomosis made to close it. The case was carefully watched, as it was feared obstruction to the outflow of urine might follow. The patient did well and returned home in the fourth week. Seventeen months later she was delivered of a boy by means of forceps. Soon after this a large, hard mass was found on the left side which felt like an ovarian cyst. There was no pain, and it was thought to be a recurrence of the fibroid. Four months later another tumor developed on the right side, both being movable.

A second operation was performed two years after the first, and upon opening the abdominal cavity a long nodular, lobulated mass was found upon the uterus, apparently part of it, and composed of several tumors. On exploring with the hand in the pelvis, it was found that the growths were not connected with the uterus, but were attached to the omentum and surrounded by adherent small intestine. Each tumor had a pedicle of omental tissue which contained blood-vessels. In all, seven of these growths were removed, and the last, which so much resembled a kidney that it was thought to be one until exploration proved otherwise, was attached to the ureteral anastomosis which had been made two years previously. The right ovary was cystic, and was removed together with the tube. Three small nodules were noticed on the left side of the uterus, but these were left untouched. Soon after this operation, a swelling developed at the site of the original tumor—the fifth lumbar vertebra, and rapidly increased in size. This was accompanied by a rise of temperature which reached as high as 104°F. , and it was feared the abdomen would have to be again opened. However, she soon began to improve and returned to her home in a few weeks. The tumor is still there and is probably growing, but the patient is doing well and has gained strength and weight.

DR. CHARLES P. NOBLE of Philadelphia read a paper, entitled

THE HISTORY AND PRESENT STATUS OF HYSTERECTOMY FOR FIBROID TUMORS OF THE UTERUS.

The author gave a *résumé* of the development of hysterectomy for fibroid tumors of the uterus, and referred especially to the part taken in it by American surgery and paid a glowing tribute to the operators of this country. He described the different methods of performing the operation: (1) stitching the stump in the abdominal wound; (2) covering it with flaps of peritoneum and dropping it back in the peritoneal cavity, and (3) total extirpation. The following conclusions were drawn:

Surgery is indebted to America for ovariectomy and for hysterectomy for fibroids. Ovariectomy was originated by McDowell in 1839, and hysterectomy must be considered as an outgrowth from it, the first fibroid tumor having been operated upon under a diagnosis of ovarian tumor. The first hysterectomy for fibroid tumor, deliberately undertaken, was performed by Kimball in 1853.

The type of hysterectomy in America has been supravaginal amputation. This method was adopted by Kimball and by Burnham in 1853. Many surgeons of all countries have worked in this field, notably Schroeder, but in the evolution of the operation, the steps in the technic which have rendered it simple and safe have been originated by other American surgeons. These steps are notably:

1. The retroperitoneal treatment of the stump—Emmet, 1884; Eastman, 1887; Dudley and Goffe, 1890.
2. The ligation of the trunks of the ovarian and the uterine arteries in their course through the broad ligaments—Stimson, 1889; Baer, 1892.
3. Amputation through the cervix well below the internal os, and the omission of constricting ligatures in the tissues of the cervix—Baer, 1892. The substitution of a few catgut sutures to close the cervix and prevent secondary infection from the vagina through the cervical canal.
4. The origination of a systematic technic for the removal of intraligamentous fibroid tumors—Pryor, 1894; Kelly, 1896.

The mortality of fibroid tumors is greater than is usually stated. It much exceeds the mortality of operations for the cure of the disease.

The mortality of supravaginal amputation for fibroid tumors of the uterus at the present time is about five per cent.

The mortality of total hysterectomy is greatly increased by the traditional policy of delay in advising operation for fibroid tumors, which still influences both practitioners and surgeons.

Early operation for fibroid tumors should be urged upon the basis of genuine conservatism as contrasted with spurious conservatism. Early operation insures a low mortality. It permits the substitution of myomectomy for hysterectomy in women of child-bearing age in a larger percentage of cases than is possible with tumors of large size. It conserves the life and the health of the patient, and, when myomectomy can be performed, restores her sexual organs to functional integrity.

The policy of delay, or spurious conservatism, conserves only the continued growth of the tumor. It entails upon

patients years of invalidism or semi-invalidism, and subjects them to much greater risks than those of early operation. Finally, many of those who have suffered for years in the hope of relief without operation are obliged to submit to hysterectomy when their chances for recovery are much less than had the operation been done early.

The next advance in the treatment of fibroid tumors will be the acceptance of early operation with the definite purpose of substituting myomectomy for hysterectomy in women of child-bearing age, in cases having only a small number of fibroid nodules.

DISCUSSION.

DR. R. S. SUTTON of Pittsburg said the surgical treatment of fibroid tumors of the uterus has been a progressive evolution since the days of Kimball. He did not think, however, that every woman with a fibroid should be operated upon. The late Thomas Keith had made the statement that only ten per cent. of all women so affected died as a result of the tumor when it was left untreated, and that, to make the operation justifiable, the mortality following it should be less than this. The speaker advocated conservative measures in those cases where the tumor caused no symptoms. Operations are dangerous, even in the hands of experienced men, and he thought they should be resorted to only when absolutely necessary.

DR. ARTHUR W. JOHNSTONE of Cincinnati considered the treatment of these cases one of the most important questions in modern surgery. His views on the subject, like those of his teacher, Lawson Tait, who, by the way, was considered very radical, were conservative. The speaker had seen 500 cases of uterine fibroid and had operated on only 100 of them. He occasionally removed the appendages to arrest the growth of a fibroid, and had never lost a case and never seen one which was not benefited by the operation. Some of these tumors are of a lymphoid nature, and in these cases the menopause, whether naturally or artificially produced, has no effect, and nothing but a radical operation will cure them. Such cases, however, are rare. When a case demanded it, he was in the habit of performing hysterectomy, and whenever possible, he left the cervix and never tried to close it, because there was sure to be a certain amount of drainage. Like the preceding speaker, he was in favor of conservative treatment, and thought many women were operated upon who did not require such radical treatment.

DR. B. F. BAER of Philadelphia was also an advocate of conservative treatment, but believed that conservatism in these cases is in the direction of radical surgery. He sometimes did myomectomy, but preferred supravaginal amputation of the uterus. This was the position he held in 1892, and he had had a great deal of experience since then. It is not conservatism to decry an operation which has been successful, and has saved so many lives and so much suffering. He did not believe a fibroid of the uterus could exist and not produce suffering at some time or other, and his experience had led him to advise against waiting for the menopause for relief. It is only exceptionally that the menopause has a beneficial effect, and in 95 out of 100 of these cases he was ready to advise operation.

(To be continued.)

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

(Continued from page 600.)

SECOND DAY—MAY 5TH.

The attendance at the second session of the general congress was fully three times as great as that of the first day. The session was held under the auspices of the Association of American Physicians, the American Physiological Society, and the American Pediatric Society. DR. WILLIAM H. WELCH of Baltimore presiding. The subject for discussion was

INTERNAL SECRETIONS CONSIDERED IN THEIR PHYSIOLOGIC, PATHOLOGIC, AND CLINICAL ASPECTS.

The first paper, on the

PHYSIOLOGY OF THE INTERNAL SECRETIONS,

was read by DR. WILLIAM H. HOWELL of Baltimore. (Dr. Howell's paper will appear in a succeeding issue of the NEWS.)

Following this, DR. RUSSELL H. CHITTENDEN of New Haven, Conn., read a paper on

INTERNAL SECRETIONS CONSIDERED FROM A CHEMICO-PHYSIOLOGIC STANDPOINT.

The essayist desired to emphasize the fact that the symptoms which follow the simple removal of a physiologically active gland from the body result solely from the loss of the gland. When attention was first called to the possibility of producing typical myxedema in monkeys by the removal of the thyroid gland, there was a tendency to explain the phenomena as resulting from an injury of the sympathetic or other nerves of the neck rather than to admit even the possibility of a general or limited disturbance of the metabolism of the body through chemical changes associated with the removal of the gland. It was not until the experiments of Murray made clear the fact that the effects resulting from the removal of the thyroid in man could be overcome, in part at least, by the administration of the gland substance, that scientific investigation took the proper turn, and a full realization of the possible importance of the so-called ductless glands and their internal secretions began to dawn upon the mind. To-day we recognize their functional activity as a necessary element to the welfare of the body.

The literature of the subject was then carefully reviewed. The thyroid gland manufactures one specific substance of marked physiologic power—the so-called colloid of Hutchinson, a body which, although containing phosphorus, is not a nucleoprotein, neither is it allied to mucin. It is peculiar in that it contains iodine. This body, when acted upon by the gastric juice, or by boiling acid, is split into a proteid and a non-proteid part, the latter containing all of the phosphorus and a larger part of the iodine of the original colloid. According to Hutchinson, both parts of the colloid are physiologically active, but the non-proteid part, the iodothyron of Bauman, is unquestionably far more active than the proteid part of the original molecule. This substance is apparently the physiologic equivalent of the thyroid gland.

For the sake of completeness, the speaker made brief

reference to Notkin, whose theories are now known to rest upon a false foundation.

Concerning the other internal secretions, DR. CHITTENDEN had but little to say, owing chiefly to the fact that there is little chemico-physiologic knowledge at our disposal. In reference to the adrenals, however, he stated that there is some evidence of the existence of two physiologic substances, one insoluble in ninety per cent. alcohol—possible the sphymogenin of Fränkel—which increases blood-pressure; the other freely soluble in alcohol, which causes paralysis of the heart and muscles and death by suffocation. In this connection he called attention to the fact that Oliver and Schäfer have shown that the active principle (or principles) is non-volatile and that its activity is not destroyed by mineral acids or gastric digestion, while alkalies greatly diminish it. According to Marino-Zuco, the toxic action is due to the presence of neurin-glycero-phosphate. There are also some grounds for believing a benzo-catechin-like body to be present, which may exert some physiologic action.

Lastly, in extracts of the testis, a peculiar nitrogenous body, free from oxygen, has been detected, known as spermin, and which is claimed by Poehl to have a marked influence upon metabolism and to act as a true physiologic stimulus. Further discussion of these points, however, at the present time, would have little value.

The next paper,

THE INTERNAL SECRETORY ACTIVITY OF GLANDS IN RELATION TO THE PATHOLOGICAL ANATOMY OF SUNDRY MORBID CONDITIONS (SEE PAGE 581),

was read by DR. J. GEORGE ADAMI of Montreal.

DR. FRANCIS P. KINNICUTT of New York opened the discussion by reading a paper on the

CLINICAL ASPECT OF THE INTERNAL SECRETIONS.

He called especial attention to the beneficial effects which have been obtained from the administration of thyroid extract in myxedema. It has been shown that the patients can be cured after as long a time as even fourteen years, but that the maintenance of health can be secured only by a continuation of the remedy during the rest of the life of the individual. In support of these statements, reference was made at some length to the remarkable results reported with the treatment by Murphy, in that patients were not only restored to apparent health, but were fitted for such arduous tasks as mountain climbing. Cases were also reported which had come under the observation of the speaker. He showed that not only could myxedema be cured, but that the fearful lack of skeletal development could be overcome in these cases, and the mental condition be very materially improved at the same time by administration of thyroid extracts. The radiograph has been used to determine skeletal growth with reference to prognosis in these cases. It is noteworthy also that a relative softening of bone has been observed to follow what was believed to be an over-dosage with thyroid extract. It is justifiable to conclude that the treatment with thyroid extract holds forth every promise of a child's development, in congenital cases, when the treatment is commenced early and persistently continued.

Goiter.—Turning to the other morbid conditions, the speaker remarked that the benefit obtained from the administration of thyroid extract in goiter has not been satisfactorily explained. The benefit consists in the retrogression of the goiter, through recession of the hyperplastic tissue. Kocher attributes the benefit to a shrinkage of the parenchymatous tissue. Complete disappearance of the tumor has been rarely observed. Reports of permanent cures have not been sufficiently numerous to allow of positive statements. Recurrence after discontinuance of the treatment has been observed, and it is probable that a prolongation of the treatment is also necessary in this condition.

The speaker then referred to the literature of the subject. From it he concluded that varying, although almost uniformly beneficial effects, were obtained from thyroid treatment in all forms of goiter. Finally, he remarked that thyroid treatment has been found to be beneficial in quite a number of conditions in which perversion of the thyroid function has not been observed. The use of thyroid extracts in various forms of insanity was doubtless based upon the power of the agent to increase metabolism. Bruce believes that its action under these circumstances is a complex one. First, the fever which is induced is often beneficial; and second, the thyroid apparently supplies something which is deficient in the systems of these patients. Allan Starr finds its effects especially beneficial in cases of acute mania occurring about the climacteric period.

Obesity.—The literature of this subject is already very voluminous and the results have been generally favorable. There is a decided increase in the excretion of nitrogen following administration of thyroid extracts as compared with that received with the food. It has been shown that there also is an albuminoid waste which should be compensated for by a regulation of the diet. Benefit is also seen in cases due to over indulgence. Loss of weight is greatest during the first days of treatment, varying during subsequent days without apparent cause. Only exceptionally has improvement been long continued.

Cutaneous Diseases.—The expectations from this treatment in cutaneous affections have not been realized. Only in psoriasis has any marked benefit been derived from it, and even in this affection the results have not been as great as were anticipated.

The Adrenals.—Modern literature strongly indicates that the adrenals are functionally active glands. One view is that the function is excretory; the other, that it is secretory. The conclusion of various observers seems to be that a substance is produced which is capable of neutralizing the effects of certain products of metabolism, or of bacterial activity. The result of the reabsorption of the secretion of the adrenals is the stimulation of the vagi and other nerves of the sympathetic system, thus stimulating respiration. Other observers have concluded that the action is directly on the muscles, without the intervention of nervous mechanism. The employment of adrenal extract has been advocated in cases in which the function of these glands has been supposed to be deficient. In Addison's disease, for example, the speaker

had seen marked benefit from this treatment. One case of Graves' disease has been reported in which the treatment was beneficial. In some of the cases of Addison's disease in which benefit had been obtained relapse and death afterward occurs. In cases of atrophy of these glands he thought it is apparent that most benefit would be obtained from treatment with extracts of the glands.

He then made brief reference to the treatment with extracts of the thymus gland and pituitary body, and reported some experiments which he had made in his hospital wards in cases of apyretic phthisis. His conclusion is that it is not a stimulant of nutritive processes in general. Only a few symptoms were ameliorated. He suggested that the stimulation of the heart muscle, or the walls of the blood-vessels which had been observed after the administration of the extracts of adrenals indicated their use in cases in which the functions of these organs are impaired. Their action is believed to be beneficial in cases of heart failure, but further study is necessary to determine their true therapeutic value. The action is not unfavorably influenced by gastric digestion, and comparatively large doses may be administered, as much as 45 grains daily, for very long periods without injurious effects.

DR. JAMES J. PUTNAM of Boston then read a paper in continuance of the discussion. He took a somewhat less extensive view of the subject than his predecessors, holding that the only affection which we can as yet positively assert to be of thyroid origin is the myxedema cachexia. It is even doubted whether true endemic cretinism should be included as a thyroid affection. He then described the peculiarities which characterize the cretin. Intermediate forms of the disease occur, he said, and the differences of type are claimed to be due to the fact that the cretin is degenerate as well as myxedematous, in consequence of morbid in-breeding. At all events, it is noteworthy that true cretinism is not benefited by thyroid treatment to anything like the same extent as so-called sporadic cretinism.

It is still a question how far in the direction of what is ordinarily called "health" we ought to extend our conception of myxedema, and it is probable that some of the changes commonly attributed to old age are a result of lack of thyroid secretion. Horsley suggests that some of the symptoms of Graves' disease, especially the dyspnea, may be due to a lack of certain constituents of this secretion. When one considers that the structure of the thyroid does not provide for the pouring out of a definite quantity of secretion, that half the gland may be cut away, and that at autopsies it is often found atrophied or hypertrophied, the conviction forces itself upon the mind that an exact balance between thyroïdal and antithyroïdal substances and tendencies cannot at every given moment exist, and that leanings toward thyroïdal excess or of thyroïdal deficiency must be present during what seem to be normal states.

Reference was then made to the discussion of the subject of obesity in its relation to thyroid treatment at the Congress of German Physicians at Wiesbaden last summer, when Spitzer pointed out the fact that a sharp dis-

tingtion should be made between the obesity which is due to food, mode of life, etc., and that which is due to metabolic activity. Ewald has not, however, found this distinction tenable in practice.

Referring to the complex series of symptoms which result from castration, he stated that it is conceivable that eunuchism might be benefited by following the line of treatment for myxedema and giving testicular extracts, and he was surprised that it had not been tried. It would, however, be hard to believe that the same treatment would work so satisfactorily in infantilism.

The Congress then adjourned to the library of the Army Medical Museum to participate in the ceremonies of unveiling the statue erected by the American Surgical Association and the Alumni Association of the Jefferson Medical College in honor of the late Professor Samuel D. Gross.

The exercises were conducted by the American Surgical Association, Dr. J. Collins Warren of Boston, chairman, acting as master of ceremonies. Prayer was first offered by the Rev. B. L. Whitman, President of the Columbian University.

The presentation of the statue to the United States Government was then made in an address by DR. CLAUDIUS H. MASTIN of Mobile, Ala. He first referred briefly to the high character of the Association which presented the statue. They had come together to honor one of their distinguished members who is now dead, and to show their appreciation of what he had done. His life and character were such as are worthy of the emulation of everyone. Born of German parentage, he had acquired those sterling qualities of head and heart which characterize the race from which he sprang—qualities which are essential to great deeds and invaluable in the contest for the survival of the fittest. We find him a poor boy, without the prestige of name or the influence of family or fortune, of studious habits, ambitious, struggling and toiling along in the paths of a young practitioner of medicine. We know how he surmounted obstacle after obstacle. Adversity came and was thrown aside. Nothing daunted, he pressed on to a higher career. Ere he had reached the meridian of life he had become a master in surgery. Endowed by Nature with the strong intellect which he had fully cultivated, he dedicated it to the relief of human suffering and thereby lengthened the span of human life. He reached the highest position ever attained by an American physician. He was fearless, and withal, without arrogance, he was charitable. He was crowned with the highest degrees of almost every foreign university. He had added to literature by exhaustive research. A voluminous writer, he was the author of many books which, by translation into various languages, have become standard the world over, wherever the art of surgery is known, or wherever Hippocratic medicine is practised. "Full of years, full of honor, beloved at home and abroad, he rounded up his great career and rested from his labors on the 6th day of May, 1884. Such is the outline of a life which in the prodigality of Nature, was not intended for any age, but for all time, a life of which we can truly say '*Finis coronat opus.*'"

The speaker then referred briefly to the origin, work, and completion of the movement which had terminated in this presentation of the statue to the people of the United States.

BRIGADIER-GENERAL GEORGE M. STERNBERG, Surgeon-General U. S. A., in accepting the statue for the Government, remarked that it was a pleasing duty which had been conferred upon him to accept, in the name of the people of the United States, this mark of honor and respect bestowed upon the memory of one who had been so honored and so beloved. He had not come to pronounce a eulogy upon the distinguished Gross: this honor had been conferred upon another better able and qualified by long association with the late distinguished surgeon for the task. He referred to the vast contributions which he had made to the literature of surgery, and said that it was fitting that the statue had been placed so near to the Army Medical Museum, in the library of which so much of his literary work had been done. After dwelling upon the advances that have been made in surgical practice in recent years, and the pleasure that a knowledge of these advances would have given Dr. Gross, the speaker said that he felt justified in conveying to the donors of the statue the thanks of the entire medical profession.

DR. WILLIAM W. KEEN of Philadelphia, successor to the Chair of Surgery in Jefferson Medical College, then delivered the address of the occasion, which consisted in a brief narration of the life, history, and achievements of Professor Gross. (See page 591.)

AMERICAN SURGICAL ASSOCIATION.

(Continued from page 603.)

SECOND DAY—MAY 5TH.

DR. DEFOREST WILLARD of Philadelphia showed and explained a large number of photographs.

DR. EDMOND SOUCHON of New Orleans read a paper, entitled

THE OPERATIVE TREATMENT OF IRREDUCIBLE DISLOCATIONS OF THE SHOULDER, RECENT OR OLD, SIMPLE OR COMPLICATED.

The speaker considered all the forms and varieties of irreducible dislocation of the shoulder, and studied to determine the operation which should be performed for each variety, the difficulties and complications after the operation, the immediate results, the remote results, and formulated conclusions as to the advantages or disadvantages of each. The study is based on one hundred and forty cases operated upon. The profound silence of the text-books and also of special books on dislocations in regard to this most important subject renders this study most imperative and timely.

All irreducible dislocations, recent, simple, or complicated with fracture, that were operated upon by reduction or resection have given good results, with one exception, in which death occurred, and did not seem to be due to the operation alone, but to a complication of unusually severe shock.

Irreducible dislocations, old, simple, and forward, operated upon by resection through an anterior incision, are

the most frequent, fifty-six cases against thirty-three by arthrotomy and reduction. Remote results show a great mortality percentage in resections from injuries to the vessels, but this is avoidable with special care. The fatalities in reduction have been due to sepsis, now preventable. The disadvantage of reductions is necrosis, calling later for sequestratomies and resections. This is probably due to the greater dissections and denudations of the head and surgical neck necessary for reduction than to simple resection of the head. Reduction is the more desirable operation of the two because it preserves the head and all the movements depending thereupon, but the necrotic consequences are serious drawbacks, as is also the ankylosis which sometimes follows the reduction. It should not be resorted to unless it can be easily accomplished without too extensive dissections although it may be necessary to use hooks, levers, and some curetting of the cup, as the cases reported show. The duration of the dislocation is immaterial; it is the condition of the parts that is all important. Recent irreducible dislocations have been as much, if not more, troublesome than dislocations of long standing.

The anterior incision is the route of selection in all forward dislocations; almost all forward cases operated upon by the axillary route and the posterior incision have been unfavorable. Cases reported as operated upon by subcutaneous section of fibrous bands, of tendons, of muscles, and by osteotomy, have given good results, but their number is as yet limited. It seems extraordinary that surgeons have not employed these methods oftener; perhaps they have, but, having failed, have not reported the cases. Considering the extent and the density of the tissues binding down the head and surgical neck to the surrounding parts, reported by operators, it is a wonder that these methods should succeed except in unusually loose cases.

Irreducible dislocations, old and downward, four in number, have all been treated by the axillary incision with resection, *i. e.*, removal of the fractured head found more or less loose in the axilla, with favorable termination. In one case, however, the head was "pegged back" and reduced, with a good result. One downward dislocation (Desprès) was treated by osteoclasis, but it was a failure, no false joint forming. Yet there are cases on record of forward dislocation in which the bone was fractured near the head or through the surgical neck during the efforts at reduction, and which yielded a fair result.

Irreducible dislocations, old and backward, in the adult, have been reported twice. They were operated upon by resection, with a very ordinary result.

Irreducible dislocations, old, upward, and operated upon, have not been recorded.

Irreducible dislocations, congenital, have been operated upon several times; they were old, backward dislocations. Two cases were operated upon by reduction; one patient died, the other had to have sequestra removed, but eventually recovered. Three cases were operated upon by resection; two with good results; in the third the result is not given.

Irreducible old dislocations in young subjects or in old

subjects were duly considered by the author; also, old dislocations double, *i. e.*, of both shoulders; as well as spontaneous or pathologic and paralytic irreducible old dislocations.

The forms and varieties due to complications accompanying irreducible old dislocations were fully treated and also the forms and varieties due to relapses or recurrences and to the sequels of the operations performed for irreducible dislocations, old, simple, or complicated.

DISCUSSION.

DR. J. EWING MEARS of Philadelphia, referring to Dr. Souchon's paper, advised that the word "irreducible" should be dropped and the word "unreduced" substituted. The word irreducible is a term which can be applied when efforts at reduction are limited to manipulation, while the word unreduced would refer to dislocations which cannot be reduced even by operative procedures. He suggested that some rule should be laid down as to when a dislocation should be considered acute and when chronic. In all cases of recent dislocation of the shoulder which cannot be reduced by manipulation, and operation is considered advisable, he recommended an incision through the deltoid muscle as being probably the best method. He considered that disability and pain were the two indications for operative interference in old dislocations, and mentioned that he had seen cases of old unreduced dislocations in which as much freedom of movement had been accomplished as was usual in excision of the head of the bone without any bad effects. In some old cases of dislocation he considered massage as being advisable before resorting to operation. With regard to the relief of pain in these cases, he thought any operation that would relieve pressure should be performed, and that that was a question that could hardly be discussed. He referred to an operation performed by himself in 1886 in which he did a subcutaneous section of the neck of the humerus, in which the object was to form a false joint. Although the operation was successful as far as the relief of pain was concerned, upon the death of the patient one year later, examination showed that a false joint had not been formed, but union had taken place at an obtuse angle in such a manner as to pull the head of the bone off the axillary plexus. The tissues around the joint had been stretched to such an extent as to permit the head of the bone to return almost to the glenoid cavity.

DR. JOSEPH RANSOHOFF of Cincinnati considered that operative treatment in uncomplicated dislocations of the shoulder of recent occurrence were so readily reducible under anesthesia by manipulation, that operative treatment very rarely came into the question, and that unreduced dislocations of long standing, as far as treatment is concerned, must be entirely determined by the degree of disability entailed. Where this is slight the patient is enabled to gain a livelihood, and pressure symptoms are absent, particularly if the dislocation is one of more than two or three months' standing, the advisability of operative interference must be questioned. But pressure upon the vascular, or nerve trunks was a positive indication for operative interference. The operations

suggested and practised for irreducible dislocation of the shoulder are (a) subcutaneous division of the adhesions, (b) subcutaneous osteotomy of the neck of the humerus, (c) arthrotomy, and (d) resection. The French surgeons alone advocate the first-named; however, the last two are most frequently indicated. In old cases, even where reduction is accomplished, there remains where the head had been situated a large cavity bounded by firm fibrous walls and often lined with an imperfect serosa which closes with difficulty and affords a ready nidus for infection. The earlier interference is practised the better are the final results. The immediate fatality following arthrotomy is very considerable. The present status of the question of operative interference in shoulder luxations may be summarized as follows:

(a) Immediate operative interference is indicated when the ordinary methods by manipulation under anesthesia have failed, (b) In irreducible dislocations, operations should not be delayed until irremediable changes have taken place in the capsule and about the humeral head. In comparatively recent cases arthrotomy offers the best results. (c) In old-standing cases the conditions found must determine the choice between arthrotomy and resection. (d) In unrecognized dislocations of long standing, a year or over, only grave compression symptoms should be recognized as indications for interference. (e) Special attention should be given to the prevention of sepsis, since in a very large proportion of cases recorded sepsis has been either the cause of death, or by the destruction of the humeral head, or obliteration of the joint cavity, has frustrated the very object of the operation.

DR. J. J. OWENS of Chicago stated that his experience with cases of this kind was limited to three, the first one of which was of the subcoracoid variety; in this, attempts at reduction were unsuccessful, and it was necessary to cut down through the deltoid muscle into the joint. Caries, suppuration, and necrosis set in, and finally resection had to be done. Since this case, he had seen one which proved to be a dislocation of seven or eight-weeks' standing, although it was said to be a fracture. In this instance an incision was made through the deltoid muscle, which was enlarged with a probe-pointed bistoury, but it was still impossible to reduce it. The subscapular tendon was then divided, and although nothing could be found which seemed to be holding the bone, it was still impossible to reduce it, and a resection had to be done, which was followed by excellent results. The third case was one of dislocation, which had been overlooked and mistaken for a fracture, and in this case also manipulation failed. In performing Kocher's method of rotation of the arm outward, the upper end of the bone gave way. Its position was improved at once, and the pain finally disappeared. In order to prevent union, and to make a false joint, if possible, the bone was moved every day. Movement increased, and considerable usefulness was secured, so that the accidental result proved satisfactory.

DR. JOHN B. ROBERTS of Philadelphia referred to one case in which, in attempting reduction, much bruising of the soft parts resulted, and it was necessary

to postpone operative interference until this condition improved. Later he discovered that he had put the head of the bone on the brachial plexus, so that the patient was worse off than ever, and resection was necessary. The patient succumbed from shock and hemorrhage within twenty hours.

DR. L. MCLANE TIFFANY of Baltimore saw no reason why cases of dislocation of the shoulder joint should be considered in a different manner from those of any other joint, and considered free opening a proper procedure. As to the time when a joint should be considered irreducible, no hard and fast rule could be laid down as the variations are too great. After the head of a bone is firmly fixed in its abnormal position, resection is the best thing to do, as a painless and useful arm will invariably result.

DR. SOUCHON closed the discussion of the paper, and referred to the fact that even Dr. Kocher had fractured cases in his attempts to reduce dislocations, and one patient had died. He spoke against waiting too long before operating on these cases on account of the adhesions which so often occur. He considered the deltoid muscle the all-important factor in the operation, and particularly on account of the division of the filaments of the circumflex nerve and the resulting paralysis. He laid great stress upon the after-treatment, and particularly as to when it should be commenced, stating that this must be decided according to the case.

DR. E. H. BRADFORD of Boston read a paper on

TENDON ANASTOMOSIS.

Referring to the transplantation of tendons and tenoplastic surgery, he spoke of the good results which have followed the transference of one of the perineal muscles from one side of the limb and attaching it to a paralyzed muscle on the opposite side to correct a deformity of the foot resulting from such paralysis. He also referred to the union of the anterior tibial and extensor longus pollicis muscles, to shortening the extensor tendons of the foot and also of the Achilles tendon, as well as transplantation of the sartorius tendon. In cases of spastic paralysis, he advocated lengthening of tendons and muscular fasciæ in the popliteal space, in the groin, in the forearm, and in the hand. He also showed diagrammatically a method of splitting the patella, of shortening a lengthened ligamentum patella, and shortening a relaxed capsule. He stated that before transplanting a muscle one should prove by electricity that the muscle itself is alive and healthy, and strong enough to do the work. He stated that excellent results have followed these operations, and demonstrated with photographs and drawings cases before and after operation.

DR. JOHN B. ROBERTS of Philadelphia referred to a case in which paralysis of the extensor of the fingers existed, and in which a laceration of the common extensor was found. Upon attaching the piece of tendon of this muscle to the thumb, the hand was rendered practically as good as ever.

DR. DEFOREST WILLARD of Philadelphia stated that in a number of cases in which he had employed similar methods much improvement had followed.

DR. BRADFORD closed the discussion by referring to a case of Dr. Dawbarn's in which the insertion of the ligamentum patella was transferred by chiseling off the tubercle to which it is attached, crushing a portion of the tibia, and inserting the tubercle there.

DR. JOHN B. ROBERTS of Philadelphia read a paper, entitled

THE SURGICAL TREATMENT OF SUPPURATIVE PERICARDITIS.

The author advocated, as he had since 1876, the treatment of pericardial effusions in the same manner as pleural effusions, and stated that paracentesis was insufficient to cure suppurative pericarditis. Incision and drainage were essential and should be adopted as soon as the diagnosis of pus in the pericardium was made. The diagnosis of the purulent character of the effusion was only determinable by exploratory puncture. This should be done at the upper part of the left xiphoid fossa close to the top of the angle between the seventh cartilage and the xiphoid cartilage. Pericardiotomy should then be done after resection of the fourth and fifth costal cartilage in the manner described by the author. The operation was believed to be novel in some of its details, though others have recommended and operated upon by various forms of resection. This method was devised to avoid injury of the left pleura, which is nearly always a complication in the ordinary methods of puncturing or incising the pericardium. As a rule, empyema is liable to occur as a sequel of pericardio-puncture or incision in suppurative pericarditis. The prognosis is good in pericardiotomy for pyopericardium. In a table of twenty-six collected cases, ten recoveries and sixteen deaths were shown. This gave a percentage of recovery of 38.44 per cent. Of the fatal cases, at least nine were septic, and all the others which died had complicating lesions, such as pleuritis, pulmonary, cardiac, or renal lesions. The operation devised by Dr. Roberts consisted in raising a trap-door of the fourth and fifth costal cartilages and connecting soft parts and using the tissues of the third interspace as a hinge. The internal mammary vessels and left pleura are thus exposed and pushed to the left.

DR. CHARLES B. PORTER of Boston discussed this paper and gave the history of one case which was operated on in a manner similar to that recommended by Dr. Roberts. The result in this case was that after convalescence was established the patient was in excellent health and was able to ride a bicycle a considerable distance without fatigue. With regard to the indications for the operation, it may be said with confidence that the percentage of recoveries after its performance warrants the statement that it is indicated in all cases of purulent pericarditis. The author then referred at some length to the surgical anatomy of the pericardium and said that the ideal operation was as far as possible (1) to avoid opening the pleural cavity, (2) to open the pericardium opposite the point where drainage will remain good after the sac has contracted, and (3) to secure permanent and free drainage. He then detailed the steps of the operation and referred to a number of cases of reported recovery

from purulent pericarditis treated by incision and drainage. A number of charts and diagrams accompanied the paper.

DR. J. MCFADDEN GASTON of Atlanta, Ga., discussed this paper and stated that discussion on this subject have lately inclined to more vigorous measures of internal treatment before using any means of mechanical evacuation. The conditions were more urgent in pericardial effusions than in pleural effusions. It may be said that aspiration is not applicable to purulent collections in the pericardium and should be limited to serous effusions. The author then referred to a number of medical publications in which references were made to this subject and stated that the only means available for testing the character of the contents of the pericardium is the aspirator or the hypodermic syringe. If serum is found, it should be evacuated and medication begun with such agents as have been found most efficacious in serous pleural effusions, but if a purulent collection is already present, the case required incision and drainage without delay.

DR. ROBERTS closed the discussion by stating that he would add the cases referred to by the gentlemen to the statistics in his paper.

DR. S. H. WEEKS of Portland, Me., read a paper, entitled

REPORT OF A CASE OF REMOVAL OF THE GASSERIAN GANGLION.

The author gave the history of the case as related by the patient himself, and the only apparent cause for the neuralgia seemed to be excessive mental work. After describing at length the details of the operation, the speaker stated that the only marked symptom remaining is inability to call up or speak certain names. There seems to be a limited amount of aphasia, which has been present from the first, but which is gradually disappearing.

DR. G. R. FOWLER of Brooklyn stated that he knew the patient personally, and could vouch for his intense suffering previous to the operation.

He also reported that the two cases of ligature of the common carotid and of the external carotid, performed to starve the Gasserian ganglion which he reported to the Society last year have remained free from a return of the disease.

THIRD DAY—MAY 6TH.

DR. DUDLEY P. ALLEN of Cleveland, Ohio, read a paper on

THE ORIGIN OF APPENDICITIS.

DR. L. M. TIFFANY of Baltimore read a paper on
INTRACRANIAL SURGERY,

after which the society went into executive session and elected the following officers: President, Dr. S. F. Hewitt, St. Louis, Mo.; Vice-Presidents, Dr. J. McFadden Gaston, Atlanta, Ga., Dr. M. H. Richardson, Boston; Secretary, Dr. H. L. Burrell, Boston; Treasurer, Dr. G. R. Fowler, Brooklyn.

The next meeting of the Association will occur at New Orleans, April 20, 1898.

ASSOCIATION OF AMERICAN PHYSICIANS.

(Continued from page 605.)

SECOND DAY—MAY 5TH.

A CASE OF PANCREATITIS FOLLOWED BY THE FORMATION OF A CYST.

Read by DR. A. MCPHEDRAN of Toronto. A case was detailed in which there was a history of recurrent attacks of colic for about five years, then a sudden effusion into the omental bursa, which was evacuated; after that a large cyst of the pancreas formed. This was opened and drained, and the case recovered with the persistence of a sinus. The cyst was of true pancreatic origin, but contained no pancreatic secretion. Their precise nature is uncertain. The moderation of the attacks of colic consequent upon the formation of the cyst, and their complete relief by the evacuation of the cystic contents, pointed to some mechanical irritation caused either by cicatricial contracture or external pressure.

ANGINA PECTORIS; ITS RELATION TO DILATATION OF THE HEART,

was the title of a paper by DR. J. H. MUSSER of Philadelphia. Patients who have had an attack or attacks of angina pectoris are relieved of the paroxysms if dilatation of the heart supervenes. Often, if dilatation persists, the patient may live for years and no other paroxysm occur. It seems the pain, as long ago pointed out, is due in large part to the stretching of a tense ventricle from intracardiac pressure. Such stretching is not so likely to occur in dilatation because of "safety-valve action" in the heart. This appears to explain the infrequency of angina in the young; in mitral valvulitis with regurgitation; in women, possibly; and in the occupants of infirmaries and hospitals. In the latter class the vigor of the heart muscle is lessened from lack of food, etc. Certainly it is not because of the absence of atheroma of the coronary arteries, for endarteritis is very prevalent among senile, usually alcoholic, perhaps syphilitic inmates of the hospitals and almshouses.

If the contention is true, the diagnosis, prognosis, and the treatment, tentatively admitted, is influenced as follows: The diagnosis, in that angina-like paroxysms in dilatation of the heart are probably not due to true angina pectoris; the prognosis, in that, if, as rarely happens, an undoubted attack of angina occurs in a case of valvulitis with dilatation, and even failing compensation, the patient on the one hand is not likely to perish from the angina, because of the safety-valve, while, on the other hand, it indicates that there is sufficient strong muscle fiber to insure cardiac recuperation. Further, if a patient subject to attacks of angina presents signs and symptoms of dilatation, the angina will disappear, or at least never be so severe as to terminate fatally.

That the pain is due to intracardiac pressure is more possible because of the presence of dilatation of the heart in angina *sine dolore*. Attention is called to a similar association of pain with increased tension of the globe, in acute glaucoma.

DISCUSSION.

DR. WHARTON SINKLER of Philadelphia questioned

the statement of the author that the pain in angina is due to intraventricular pressure, for in pseudo-angina the pain is just as acute as in the organic disease. He gave the history of a case of pseudo-angina in a hysterical girl in which morphia and other drugs failed to give relief.

DR. H. C. WOOD of Philadelphia also questioned the dependence of anginal pain upon intraventricular pressure. In this connection it is interesting to note the effect of nitrite of amyl. As to digitalis in this condition, if there be an insufficiency of the mitral valve there might be intense pain from its administration. It is more likely, he thought, that the pain is due to distention of the auricle. There is another thought suggested. If the theory of Dr. Musser be correct we should be able to relieve the symptoms by the administration of aconite, for it is well known that if we give enough aconite we would do away with intraventricular pressure altogether. The problem is to do away with the pain of the patient without, at the same time, doing away with the patient, and this is best accomplished by the use of digitalis.

DR. EDWARD G. JANEWAY of New York gave the history of the sudden onset of an attack of angina in a man who never before had the disease. The pain, in this case, went down the right arm instead of the left. The man had pericarditis, and Dr. Janeway had suggested that the attack might have been due to the plugging of the coronary artery by a thrombus. The man lived a week after the attack, and his pulse came down to 72 to the minute. He said he felt well enough to get up, and did get up, with fatal results. At the autopsy it was found that there was a thrombosis of both coronary arteries, a rupture of the ventricle, a drawing away of the papillary muscles. It seemed probable that the first anginal symptom was coincident with the thrombosis of the right coronary artery. It was interesting that the pain was on the right side instead of the left, corresponding with the thrombosis of the coronary artery.

DR. CARY said he would like to raise another question, and that was in regard to the true cause of glaucoma. That there was distention of the globe was certain, but that this distention produced blindness was open to question. The cause of the secretion was the real cause of the blindness, and the true cause of the glaucoma. The same thing could be said of angina; that distention of the ventricle gives rise to pain is true, but there were other causes of the anginal symptoms.

DR. J. H. MUSSER said he simply wished to lay stress upon the fact that the dilatation of the heart furnished a safety-valve action for the relief of the pain. Where there was not this dilatation the pain was continuous, and angina pectoris is usually seen in relatively strong and robust men, with strong hearts which do not yield to this intraventricular pressure. There had been no attempt to explain all the causes of angina, because they were not yet all known; but simply to call attention to the relative infrequency of angina in persons with weak or dilated hearts.

DR. J. P. KINNICUTT of New York was of the opin-

ion that thrombosis of the coronary artery was frequently the cause of the paroxysms of anginal pain. The mere stretching of the arterial walls by the embolus was sufficient to account for the pain, for all knew the exquisite pain caused by an embolism in a systemic artery.

PERICARDITIS—SOME POINTS IN ITS DIAGNOSIS AND TREATMENT.

This paper was read by DR. F. C. SHATTUCK of Boston. He pointed out that pericarditis is frequently overlooked because (1) it is not sought for; (2) it might not give rise to symptoms if dry, or if the effusion were small; (3) it is often associated with changes in the lungs and pleurae which might mask its presence. The shape of the dull area was not, in his experience, pyriform or triangular, but similar to that of general enlargement of the heart. In nearly all his cases he had tapped the pericardium; the point of election for tapping is in the fifth interspace, one or two inches to the left of the left nipple. His best results, in seven operations, had been obtained from this point—forty-six ounces in one case and sixteen in another. He was skeptical of the value of general treatment, and never resorted to any except rest. Alcohol might be useful, but blisters should be avoided. He sometimes used the ice pack when it was grateful to his patients. The answer of Sir William Gull to one of his assistants who sought to apologize for not recognizing a case of pericarditis might be borne in mind by those who were tempted to use energetic remedies in this disease. He replied that it was just as well that he had overlooked it, for if he had discovered it he might have treated it. He realized the serious nature of the operation, but he had never regretted having tapped the pericardium, but he had regretted not having done so. He believed he had saved two lives by the operation, and he thought he might have saved another case by tapping. No hard and fast rules could be laid down for the time of operating or as to the point of election. He had once tapped the pericardium at the costoxiphoid angle in a cadaver, and from his success in this he felt tempted to select the same point in a living patient. In one of his cases the tapping was only temporarily successful, and he had had his surgical colleague open the pericardial sac. This was the only case of this operation at the Massachusetts General Hospital.

DISCUSSION.

DR. JAS. T. WHITTAKER said that the condition is very rarely recognized during life. The symptoms are very obscure, and often unrecognizable. The friction sound is a transitory symptom and hard to demonstrate. He was inclined to give a more important place to tuberculosis as a condition than Dr. Shattuck had assigned to it. At least two-thirds of all cases were due to this cause. The area of dulness can often be more easily mapped out by combined auscultation and percussion. With the patient on his back and a Camman stethoscope in the ears, and lightly resting on the patient's breast, the percussion sounds are much intensified. The operation is not a particularly dangerous one. He had been doing it for many years, and had never seen any bad re-

sults. It is even easy, by the simple introduction of the instrument, to feel the pulsations of the heart. In one instance he had attempted to tap the pericardium, and although he got the instrument into the sac, and although he was confident of the existence of effusion, no fluid came through the canula. On withdrawing the instrument he found it plugged with a piece of hyaline cartilage. This taught him the necessity of selecting the point of operation with more care.

DR. H. A. HARE was of opinion that the danger of wounding the heart is much exaggerated. He had arrived at this conclusion from an involuntary experiment on a young man who was suffering from articular rheumatism. He had intense dyspnea and difficult heart action. Dr. Wilson saw the case in consultation, and a diagnosis of pericarditis was made. He was tapped twice, and although no fluid was withdrawn, the boy was wonderfully improved each time. There was no *post-mortem*, but Dr. Hare was convinced from the subsequent history that the case was not one of pericarditis, but that the young man had a normal heart.

DR. T. M. ROTCH thought this case very well illustrated the danger of tapping the pericardium. There is always a great difficulty in making a diagnosis of pericardial effusion. It is almost impossible to make a diagnosis between dilated heart and pericarditis with effusion, by the usual methods. This is easily seen in the *post-mortem* room. The danger of tapping is increased by the possibility of the heart being bound down in malposition by adhesions. As to the point of election, he had tapped a child with pericardial effusion, on the right side of the sternum. Another point in the physical diagnosis of pericarditis with effusion, which is generally overlooked, is that we will find dulness in the back between the angle of the scapula and the spinal column. He had made this discovery ten years ago, but had never published it.

DR. NORMAN BRIDGE said he was surprised that Dr. Shattuck had made no mention of dysphagia in any of his cases, for he had seen it two or three times.

DR. JAMES TYSON was especially interested in the matter of the outline of the area of dulness. This area was pyriform, while the shape indicated by Dr. Shattuck was the same as in double enlargement of the heart. For the purpose of mapping out these areas the phonendoscope was of special service. As to the use of blisters in the treatment of pericarditis, he did not think they should be allowed to pass out of use; he did not want to be made to give up his blister. He had always had a great horror of tapping the pericardium until he heard Dr. Shattuck's paper. Then he became bold and thought he might try it, but after hearing what Dr. Hare and Dr. Rotch had said he had retired to his first position.

DR. A. MCPHERDAN was of the opinion that many of the cases diagnosed as pericarditis were, in reality, cases of myocarditis. This was shown in Dr. Shattuck's cases by the fact that some of his tapplings were dry, and he believed that if all his cases had gone to autopsy it would have been shown that they were suffering from myocarditis rather than from pericarditis.

DR. F. H. WILLIAMS thought that the use of the X-ray might clear up the uncertainties between pericarditis and enlarged heart.

DR. JANEWAY said that the shape of the dull area in pericarditis with effusion was pyramidal, and he was always able to map out this area. He did not consider tapping a serious operation, and had once accidentally punctured the right heart and got blood. No harm resulted from the tapping, and when the patient died, shortly afterward, it was seen that the wound in the heart had healed.

DR. SHATTUCK, in closing the discussion, and replying to Dr. McPherdan, said he had had only one case in which there had been no fluid in the pericardial sac. It was true that some of his tapplings had been dry, but subsequent tapplings in the same cases had been productive.

DIAGNOSTIC AND THERAPEUTIC CONSIDERATIONS WITH RESPECT TO CERTAIN AFFECTIONS OF THE UPPER AIR TRACT.

was the title of a paper read by DR. BEVERLY ROBINSON of New York. The paper dealt with the utility of the laryngoscope and rhinoscope, and compared the methods of the German and French schools. Numerous examples were cited to show the contrasts between the general practitioner and the specialist in the treatment of diseases of the upper air passages.

NERVOUS DEAFNESS IN DIPHTHERIA.

A case was reported by DR. J. C. WILSON of Philadelphia of follicular tonsillitis in an adult. There had been moderate fever, occipital headache, *tinnitus aurium et cerebri*. On the fourth day dense follicular exudate was observed on the right tonsil, with conjunctivitis, increasing tinnitus, and deafness. An injection of diphtheria antitoxin serum was given, followed in a few hours by total deafness with slight vertigo, and great chemosis. A gradual defervescence occurred, and was completed by the thirteenth day, at which date there was partial paralysis of accommodation, together with paresis of the extensor muscles of the head, persistent tinnitus, slight vertigo, and absolute persistent loss of hearing. The paper also discussed the rarity of the case, its importance, the bearing of the antitoxin injection to the development of the sequelæ, the general subject of sudden nervous deafness in the infections, and the general question of diagnosis, prognosis, and treatment.

DISCUSSION.

DR. I. E. ATKINSON, in speaking of the uncertain and unsatisfactory regulations which required cultures of all suspected cases of diphtheria to be made by the board of health, related the details of a case in which he had made the clinical diagnosis of diphtheria, while the board of health had made three fruitless attempts to find the Klebs-Loeffler bacillus. He contented himself, however, with the philosophic reflection that the case was one of diphtheria, despite the failure of the bacteriologic examination, and he had not pressed the matter upon the officials because he was only too glad to be relieved of the unpleasant necessity of placarding the house. When called to see a

child with symptoms pointing to diphtheria, the question to be decided is whether antitoxin should be injected at once, or whether we should wait for a report from the board of health.

DR. W. W. JOHNSTON said that this appeared to be an era of anomalous cases. We had all recently become familiar with the peculiar lesions produced in various organs of the body by influenza. The case of Dr. Atkinson could be explained in that way, and he thought the anomalous symptoms attending Dr. Wilson's case were capable of the same explanation.

DR. WILSON, in reply, said he fully appreciated the positions taken by Dr. Atkinson and Dr. Johnson. He confessed that there was a link missing from the chain of evidence that his case had been one of diphtheria, but while he recognized the uncertainties of simple clinical diagnosis unconfirmed by bacteriologic tests, it was useless to go out of the way in search of an obscure diagnosis instead of that which the physical symptoms indicated.

A FURTHER COMMUNICATION ON THE OCCURRENCE OF A HITHERTO UNDESCRIBED FORM OF CHRONIC NEPHRITIS UNASSOCIATED WITH ALBUMINURIA,

was the title of a paper read by DR. D. D. STEWART of Philadelphia. This paper is a continuation of those on this subject, which appeared in the *American Journal of the Medical Sciences*, December, 1893, and the *MEDICAL NEWS*, April 14, 1894. It deals with an unrecognized form of chronic nephritis with distinctive symptoms, in which albumin even in traces, by the commonly employed tests, is persistently absent from the urine, and yet uremic symptoms are common. Although unable to present the result of a necropsy on a personally observed case of this sort, a portion of a kidney removed from one of them in life throws some light on the pathologic condition present.

A STUDY CONCERNING THE CUMULATIVE ACTION OF DIGITALIS.

By DR. H. A. HARE, Philadelphia. The paper consists in a discussion as to what is meant by this term, and the frequency with which this effect is produced, together with a collective statement of the opinion of other observers concerning it.

A circular letter was sent to different observers asking them:

- (a) Do you believe in the cumulative action of digitalis?
- (b) If so, under what conditions as to age, etc.—that is, what conditions predispose to this action?
- (c) If you have met with it, what were the chief manifestations of it, and what were the preparations of digitalis likely to produce these symptoms?

DISCUSSION.

DR. WILLIAM OSLER admitted that cases might occur in which digitalis would manifest a cumulative action, but he thought such cases must be extremely rare. He admitted the existence of a "digitalis pulse," but a pulse of 40 at the wrist did not, *per se*, indicate a digitalis pulse, for while the pulse at the wrist might be only 40, the

pulse at the heart might be 80. When a man had only about half a dozen drugs on which he relied, it was unpleasant to be robbed of one of them, and digitalis had been such an old and faithful friend to him that he was loathe to give it up.

DR. JANEWAY was emphatic in his opposition to digitalis. He had seen several cases in which the dangerous cumulative action had been manifested. He had frequently seen cases of sudden death come to autopsy, and nothing would be found to explain the cause of death until, upon investigation, it was found that they had been taking digitalis.

DR. WILKINS had also seen several cases in which the cumulative action of digitalis had been well marked. He had also frequently noticed such unpleasant consequences as nausea, vomiting, etc., follow the use of small doses.

DR. JAMES C. WILSON was one of those who firmly believed in the value of digitalis. He had never seen a case of cumulative action of this drug, as he understood the word, but he admitted that unpleasant effects might follow its administration in some cases just as a moderate dose of alcohol would affect some persons unpleasantly. He thought the converse of the proposition laid down by Dr. Janeway might be insisted upon, *vis.*, that instead of sudden deaths being due to the use of digitalis, they were due to the diseases for which the drug was given—usually chronic valvular disease of the heart, in which sudden deaths were to be looked for.

DR. JAMES T. WHITTAKER added his testimony to that of those who believed in the cumulative action of the drug.

DR. CARY and DR. MCPHEDRAN had also seen dangerous symptoms from the use of digitalis, and believed in the cumulative action of the drug.

DR. HARE asserted that Dr. Osler had proved just what he had tried to disprove. A pulse of 40 at the wrist and 80 at the heart was an evidence of the cumulative action of digitalis, in his opinion. When he spoke of the cumulative action of a drug, he did not mean to say that 100 drops, say, were stored up in the system, but that by the constant use of the drug lead to over-stimulation of the heart. In the administration of digitalis it should be given in large doses and at long intervals, and its use suspended from time to time. Different effects would also be obtained by preparations put up in different places, due to varying proportions of the active principles.

DR. F. H. WILLIAMS referred to the necessity of observing the directions given by Withering for the administration of digitalis, namely, that a record of the secretion of urine for twenty-four hours should be kept.

The following papers were read by title:

PNEUMONIA IN PRIVATE PRACTICE.

By DR. M. HOWARD FUSSELL, Philadelphia.

CLINICAL NOTES OF A CASE OF BRONCHO-BILIARY FISTULA.

By DR. J. E. GRAHAM, Toronto.

TYPES OF EDEMA IN INFANCY.

By DR. J. P. CROZER GRIFFITH, Philadelphia.

(To be continued.)

REVIEWS.

OPHTHALMIC OPERATIONS AS PRACTISED ON ANIMALS' EYES. BY CLARENCE A. VEASEY, A.M., M.D., Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic, etc. With fifty-six illustrations. Philadelphia: The Edwards & Docker Co., 1896.

THIS short treatise is intended to give the technic of ophthalmic operations with the slight modifications made necessary by the use of animals' eyes. The author's object has been to give, not all, but the best procedures in each category. In this endeavor he has been, in the main, successful; although, to instance one exception, the use of mules' vitreous spheres after evisceration may well be consigned to deserved oblivion. The descriptions throughout are concise, lucid, and systematic; the chapter on cataract operations being particularly good. Students of ophthalmology will welcome this guide, which gives the principles of operative technic in a nutshell.

ESSENTIALS OF PHYSICAL DIAGNOSIS OF THE THORAX.

By ARTHUR M. CORWIN, A.M., M.D., Demonstrator of Physical Diagnosis in Rush Medical College, etc., Chicago. Second edition, revised and enlarged. Philadelphia: W. B. Saunders, 1896.

IN the second edition of this little book, a section describing the signs found in each disease of the chest has been added, making a volume of nearly two hundred pages. The book is intended mainly for the use of students, but may be read by the clinician with profit. The subject is handled in a concise, systematic manner, and many valuable hints in diagnosis are given. The book contains all that can be desired in a text-book on physical diagnosis, and as such we take pleasure in recommending it as a safe guide for students.

DISEASES OF THE EYE. A Hand-book of Ophthalmic Practice for Students and Practitioners. By G. E. DE SCHWEINITZ, A.M., M.D. Professor of Ophthalmology in the Jefferson Medical College, etc. With 256 Illustrations and Chromo-lithographic Plates. Second edition, thoroughly revised. W. B. Saunders, 925 Walnut street, Philadelphia. 1896.

THE present edition of this work is well adapted for the purpose for which it is designed, namely, for the use of the student and the practitioner. It is comprised in one royal octavo volume of 674 pages; is well printed and fully illustrated. The text is admirably arranged; the discussion of each subject in its various bearings being systematically classified. More than the usual amount of space is devoted to a consideration of general optical principles, ophthalmoscopy, errors of refraction and disturbances of motility, a departure that is in keeping with the advances in ophthalmology of recent years. In describing the diseases of the eye, the design has evidently been to limit the discussion to the essentials. It is found that although the list is exceptionally full, the discussion of each disease is as brief as is compatible with a clear understanding of the conditions referred to. A few pages are devoted to the subject of "Spectacles and Their Adjustment," in which

points worthy of more than casual mention are fully discussed.

The work is one that will afford the student a good general idea of ophthalmology as it exists at the present time. The advice given and the methods advocated in the treatment of the conditions described are sufficiently conservative and are safe to follow.

AN AMERICAN TEXT-BOOK OF PHYSIOLOGY. Edited by W. H. HOWELL, Ph.D., M.D. Philadelphia: W. B. Saunders, 1896.

COLLABORATIVE works, as a rule, are not desirable means of imparting knowledge to medical students, though they are less objectionable in this respect as a means of increasing and satisfying the desire for an expression of many views on similar subjects which is demanded by more advanced study and investigation. Few subjects are given such attention by students. It is on this account that a work of the collaborative character of this one will, perhaps, not be popular among them. This is a great pity, because this book, in many features, is superior to the usual text-book compiled by one man.

The names of those who assisted in the production of this excellent book are for the most part those of men connected as teachers with the most important medical schools of the country; of men who represent the spirit of physiologic inquiry and investigation, and who have devoted their time and labor to this special branch of biologic study. The most of them are original investigators in the special physiologic subjects which they treat.

There can be no doubt that the various chapters represent our knowledge of the subject as it is to-day. Whether it be wise to discuss in a text-book mooted and unsettled questions, unless they can be definitely settled by such a discussion, is questionable. However, to one specially interested in physiologic research, such discussions will be most attractive, and will be considered of great value.

That much thought and consideration have been spent in dealing with the various subjects will be apparent to one who only reads cursorily. The book will stand as a work of reference on physiology. The chapters are carefully written, and there is very little of the overlapping of subjects, which is so pronounced an objection to other "systems."

To one who wants only the essential facts of physiology, this book, on account of its volume, would not commend itself; but to him who desires to know the status of modern physiology, who expects to obtain suggestions as to further physiologic inquiry, we know of none in English which so eminently meets such a demand.

As to the outward form of the work, nothing can be said but praise. The type, paper, illustrations, binding are all most satisfactory representatives of the book-maker's art.

The Missouri State Medical Association.—This Association will hold its fortieth annual meeting at St. Louis, May 18, 19, and 20, 1897.

The International Congress at Moscow.—Dr. Lauder Brunton has accepted an invitation to deliver one of the general addresses before the Congress at Moscow.